IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

ART+COM INNOVATIONAL POOL,) Trial Volume 3
GmbH,   )
          Plaintiff,   )
) C.A. No. 14-217-RGA
v.   )
)
GOOGLE INCORPORATED,   )
)
          Defendant.   )

          Tuesday, May 24, 2016
          8:35 a.m.
          Courtroom 6A

          844 King Street
          Wilmington, Delaware

BEFORE: THE HONORABLE TIMOTHY B. DYK,
         United States District Court Judge

APPEARANCES:

     FARNAN LLP
     BY: BRIAN E. FARNAN, ESQ.
     BY: MICHAEL J. FARNAN, ESQ.

          -and-

     BAKER & BOTTS
     BY: SCOTT F. PARTRIDGE, ESQ.
     BY: MICHAEL A. HAWES, ESQ.
     BY: LARRY G. SPEARS, ESQ.
     BY: TIMOTHY ROONEY, ESQ.

          Counsel for the Plaintiff

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APPEARANCES CONTINUED:

        MORRIS, NICHOLS, ARSHT & TUNNELL
        BY: JACK B. BLUMENFELD, ESQ.

                    -and-

        O'MELVENY MYERS, LLP
        BY: DARIN SNYDER, ESQ.
        BY: LUANN L. SIMMONS, ESQ.
        BY: BRETT WILLIAMSON, ESQ.

                    Counsel for the Defendants

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 1                    THE COURT:  Good morning.  Be

 2       seated.  I want to spend a few minutes this

 3       morning talking about this claim construction

 4       issue, but before we get to that, did counsel --

 5       do you have anything else to raise?

 6                    MR. PARTRIDGE:  Yes, Your Honor.

 7       The first is a rather simple issue which

 8       concerns an error in the transcript from

 9       yesterday.  When I was reading in the exhibits

10       that we wanted admitted into evidence, the

11       transcript blends Exhibit 1 with Exhibits 17A

12       and 17B, so the transcripts reads exhibit 117A

13       and 117B and it should be exhibit 1, PTX-1,

14       PTX-17A, PTX-17B.  So I'd like to advise the

15       Court of that error and I think counsel said the

16       exhibits were acceptable, they were doing it on

17       the basis of what I said and not blending.

18       That's number one.  And number two --

19                    THE COURT:  That error will be

20       corrected.

21                    MR. PARTRIDGE:  And number two,

22       the witness testified about the first reissue

23       patent which is PTX-2, and I neglected to offer

24       PTX-2 into evidence.
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 1                         THE COURT:  And I assume there's

 2      no objection?

 3                         MR. SNYDER:  No objection, Your

 4      Honor.

 5                         THE COURT:  That's admitted into

 6      evidence.

 7                         MR. PARTRIDGE:  And then we have

 8      an issue that we have some objections, I believe

 9      that remain to some of the testimony that's

10      coming up today, the exhibits and the like that

11      we need to deal with.  And we have an issue that

12      we'd like to talk about.

13                         MR. HAWES:  It's the same thing.

14                         MR. PARTRIDGE:  It's the same

15      thing, so those are the issues that we have this

16      morning.

17                         THE COURT:  What is the issue you

18      just mentioned?

19                         MR. PARTRIDGE:  There are

20      objections to demonstratives and exhibits that

21      have been made that need to be resolved.  They

22      mostly concern the damage issue.

23                         THE COURT:  What's the objection?

24                         MR. SNYDER:  The objection, Your
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1   Honor, is relevant and it all relates to the

2   hypothetical negotiation that there are exhibits

3   for Mr. Nawrocki's testimony as well as two

4   demonstratives that they plan to use for his

5   testimony that relate to a 2010 hypothetical

6   negotiation date and not a 2005 hypothetical

7   negotiation date that Your Honor indicated

8   yesterday is going to govern, unless there is

9   some contrary evidence, which we don't think

10   there's going to be given what they've said in

11   the complaint, but which as said in opening is

12   what we expect the evidence to be. I just

13   learned, Your Honor, that we've got a percipient

14   witness in the courtroom and maybe he should be

15   excused.

16   THE COURT: Yes. Okay. So what's

17   the Plaintiff's response to that?

18   MR. HAWES: Your Honor, with

19   regard to the two demonstratives, those were

20   actually used during Judge Andrews' Daubert

21   hearing with regard to the sessions model. They

22   challenged the use of those and those -- that

23   challenge was denied and Your Honor actually

24   denied their motion for reargument on it. These

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 1        exact demonstratives have twice been challenged

 2        by that and that challenge has been denied.

 3                     THE COURT:  Can I see those,

 4        please?

 5                     MR. SNYDER:  Well, it's the

 6        exhibits that matter.  Did you want the

 7        demonstratives or the exhibits?

 8                     THE COURT:  I would like to see

 9        whatever is being objected to.

10                     MR. SNYDER:  I'm sorry?

11                     THE COURT:  I'd like to see

12        whatever is being objected to.

13                     MR. SNYDER:  Okay.  These are the

14        exhibits.

15                     MR. HAWES:  So, Your Honor, the

16        page you're looking at was actually shown during

17        that hearing where Judge Andrews then denied

18        their Daubert motion.

19                     THE COURT:  I'm puzzled.  What do

20        these exhibits and demonstrative have to do with

21        the hypothetical negotiation date.  These seem

22        to relate to revenue forecasts for the period of

23        claimed infringement here.

24                     MR. HAWES:  And that's exactly
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 1        true, Your Honor.  I understand their argument

 2        is because of this particular hypothetical date,

 3        all of a sudden all of that is out the window,

 4        but it's been twice denied in the Daubert

 5        hearing and in your motion for reargument.

 6                    THE COURT:  So what's the response

 7        to that?  They are certainly entitled to put in

 8        revenues for the period of the alleged

 9        infringement.

10                    MR. SNYDER:  Let me take a moment,

11        Your Honor and try and remind the Court Mr.

12        Nawrocki's theory so we can put it into context.

13                    THE COURT:  Well, Mr. Nawrocki's

14        theory is not reflected in these documents.

15        These documents, I don't see any reference in

16        the demonstrative or the documents to a

17        hypothetical negotiation date.

18                    MR. SNYDER:  They are only

19        relevant because of a 2010 hypothetical

20        negotiation date per Mr. Nawrocki's --

21                    THE COURT:  Why is that true?

22        They certainly -- if they're claiming that

23        infringement for the period of 2010 on, so under

24        that theory why aren't they entitled to put in
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 1        evidence of revenues during that period?

 2                    MR. SNYDER:  Why, because

 3        Mr. Nawrocki only uses these to establish the

 4        rate.  He does not use these to establish the

 5        base.  Under a traditional damage --

 6                    THE COURT:  How do I know that

 7        until he testifies?  I don't know that.  So it

 8        seems to me you're asking me to deal with

 9        something which hasn't happened yet.  I don't

10        see on the face of these exhibits that they are

11        necessarily addressing something that's

12        irrelevant, if he starts testifying about the

13        hypothetical negotiation date being 2010, then

14        I'm going to sustain an objection because it

15        seems to me that the hypothetical negotiation

16        date is 2005 for two reasons, one, that the

17        patent existed in more or less it's later form

18        as of that date, and second, that there hasn't

19        been any showing that the Google Earth product

20        was different in 2005 than in 2010 in any

21        material respect.

22                    MR. SNYDER:  Thank you, Your

23        Honor, we will object at the appropriate time.

24        I do understand the Court's direction.  We do
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 1        need to make sure that these exhibits are not

 2        inadvertently shown to the jury before we have

 3        an opportunity to object.  This is not a

 4        percipient witness where we don't know what he's

 5        going to say.  Mr. Nawrocki is bound by his

 6        report.  We know how he used these documents in

 7        his report.  It was only to establish a rate

 8        based on a 2010 negotiation, and it would be

 9        severely prejudicial for him to put these

10        inflated revenue numbers in front of a jury

11        before we have an opportunity to object.

12                  THE COURT:  Let's see what he has

13        to say and how he plans to use them.  Is he

14        going to use them with respect to the

15        hypothetical negotiation date?

16                  MR. HAWES:  He is going to use

17        them in that way, Your Honor.  And I would note

18        that his expert report specifically lays out

19        that his analysis for the 2005 negotiation date

20        is a modification he discusses how he is going

21        to tweak what he did for 2010 so he uses some

22        analysis that he does use also for 2010, but

23        then he tweaks it or more accurately uses

24        several factors to modify it with respect to
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1   2005. That was in his expert report and by --

2   there was a Daubert deadline in this case from

3   Judge Andrews and they did not challenge this

4   methodology. We ought to be able to put this

5   methodology for determining a 2005 date into

6   evidence.

7   MR. SNYDER: That's completely

8   improper, Your Honor. What they're saying is we

9   can put on evidence in an opinion of a wrong

10   hypothetical negotiation date and then just have

11   our expert tweak it and if that's the case then

12   there are no rules for what damages experts can

13   do, they can take anything and say I'm tweaking

14   it.

15   THE COURT: This is too

16   hypothetical right now. I can't understand

17   exactly what he's going to say. I haven't read

18   the expert report. 2005 is the hypothetical

19   negotiation date. Let's see what the expert

20   says. I'm not going to let him testify to a

21   different date, but what methodology he uses to

22   come up with a royalty rate based on a 2005 date

23   remains open and I'll consider what happens

24   about that.

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1                    MR. SNYDER:  Thank you, Your

2       Honor.

3                    MR. HAWES:  Thank you, Your Honor.

4       One request, Your Honor.  I understand your

5       current ruling with regard to the negotiation

6       date.  We have not had a chance to offer Your

7       Honor any briefing on that issue, and I know our

8       final charge conference is Thursday night, we

9       would like to submit a very short brief, only

10      four pages to the Court on this issue.

11                   THE COURT:  You can do that.  I

12      would suggest you do it by 8 o'clock tomorrow

13      morning.

14                   MR. HAWES:  We will do that, Your

15      Honor.

16                   THE COURT:  Each side on the

17      hypothetical negotiation date.

18                   MR. SNYDER:  If they want to file

19      something and Your Honor wants to accept it,

20      that's fine, we understood this was established.

21                   THE COURT:  I said that my ruling

22      was tentative.  The issue has not been briefed,

23      I'll consider four pages from each side by 8

24      o'clock tomorrow morning.
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 1                    MR. SNYDER:  Thank you, Your

 2    Honor.

 3                    MR. HAWES:  Thank you, Your Honor.

 4                    THE COURT:  All right.  Now there

 5    is the issue of the order of the steps.  And I

 6    guess I asked plaintiff whether this issue

 7    wasn't conceded at the Markman hearing in the

 8    exchange that's cited by Google.  The Court said

 9    well, you would say that on that one step G has

10    to be done after step F, right, and Mr. Spears

11    responds, well, yes, I mean clearly step G has

12    to be done after step F.  So how do you get

13    around that?

14                    MR. SPEARS:  I think we simply

15    look at the plain language of step G.  Step G

16    says what portion --

17                    THE COURT:  But I'm not

18    misinterpreting what was said.

19                    MR. SPEARS:  Exactly, you're not

20    misinterpreting what was said.  I was speaking

21    generally.  There are portions of step F that

22    must be done before step G is entered into and

23    it is clearly set forth in the text of step G

24    where it says repeating step F dividing the
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1   sections with the smaller sections until every

2   section has the desired image resolution and no

3   higher image resolution data is available. So

4   step G tells you exactly what needs to be

5   completed in step F and namely it's the dividing

6   of sections into smaller sections until the

7   smaller sections have the desired image

8   resolution, so it's right there in step G.

9   THE COURT: In figure 3 of the

10   patent, what am I looking at here? Is 17 the

11   intersection of these two lines that are labeled

12   17, is that the field of view?

13   MR. SPEARS: The lines

14   intersecting 17.

15   THE COURT: On figure 3, line 17,

16   that's the field of view; right?

17   MR. SPEARS: I believe that would

18   be -- I believe that would include the field of

19   view.

20   THE COURT: And what this is

21   showing is the area of interest being dividing

22   and subdivided again; right?

23   MR. SPEARS: That's correct, Your

24   Honor.

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 1                        THE COURT:  And the reason that

 2      the rest of the grid isn't subdivided is because

 3      that's not an area of interest?

 4                        MR. SPEARS:  That's correct.

 5                        THE COURT:  Showing only the area

 6      of interest being subdivided?

 7                        MR. SPEARS:  That's correct.

 8                        THE COURT:  I'm going to rule that

 9      step G has to be performed after step F.  I

10      think you have conceded that point and I think

11      it's too late to take it back.  That's the

12      ruling on that.

13                        Now as to the order of other

14      steps, I don't understand what the significance

15      of that is.  That really hasn't been briefed.

16      If that issue comes up, I can address it at that

17      time.  I'm only resolving now that step G has to

18      be performed after step F.

19                        MR. SPEARS:  Understood.  While

20      I'm up here, one other unrelated point that I

21      would like to raise.  We have an agreement with

22      respect to how certain exhibits are going to be

23      used during the course of this trial.  It

24      pertains to source code exhibits and it pertains
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1   to very voluminous exhibits like spreadsheets.

2   The protective order is fairly

3   restrictive with respect to what we can do with

4   source code, and in light of those restrictions,

5   what we would like to do is have the witnesses

6   testify only as to highly selected and redacted

7   versions without the actual exhibits in the

8   courtroom, and that after that testimony, we

9   would move entry into evidence of the actual

10   source code exhibits notwithstanding that they

11   are not physically present in the courtroom, ACI

12   I believe agrees to that.

13   MR. SNYDER: We did agree to that,

14   Your Honor. So to describe how this would

15   practically work, the witness binders that we

16   hand out before the examinations would not

17   include the full printed copy of either the

18   source code or voluminous exhibits. After, when

19   they're moved into evidence and they're provided

20   to the Court, the source code would be provided

21   in sealed envelopes to protect its

22   confidentiality. And the voluminous exhibits

23   would be handled as we already agreed, supplied

24   to the jury on a locked computer and submitted

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 1        on a CD-ROM.

 2                    THE COURT:  Okay.  By agreement

 3        that will be done.

 4                    MR. SNYDER:  Okay.  Thank you,

 5        Your Honor.

 6                    MS. WILLIAMSON:  Your Honor, may I

 7        be heard, just to peculiar?  I understand the

 8        Court's ruling with respect to limiting the

 9        ordering to Step G being required to occur after

10        Step F, but counsel, I think gave a

11        construction, certainly a new construction of

12        Step G and I want to make sure that's not the

13        Court's ruling.  Step G clearly says repeating

14        Step F.  That means all the steps of Step F.

15                    THE COURT:  Yes, that's correct.

16                    MR. WILLIAMSON:  Okay.  Thank you,

17        Your Honor.

18                    THE COURT:  Okay.  Is there

19        anything else we need to deal with before we

20        begin?

21                    MR. SNYDER:  Nothing further from

22        the Defendants, Your Honor.

23                    MR. PARTRIDGE:  Nothing from the

24        Plaintiff, Your Honor.
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 1                    THE COURT:  Okay.  We're still

 2       waiting for three jurors, so I think we'll

 3       recess until the main jurors arrive.

 4                    (Short recess.).

 5                    THE COURT:  I think all the jurors

 6       are here, so we'll start a couple minutes early.

 7                    (Jury enters.)

 8                    THE COURT:  Good morning, members

 9       of the jury.  We'll take care of your lunch

10       orders at the break to make sure to get you your

11       lunch the way you want it.  Be seated please.

12       Mr. Partridge, call your next witness, please.

13                    MR. PARTRIDGE:  Yes, Your Honor.

14       We call Mr. Axel Schmidt.

15                        AXEL SCHMIDT,

16                    the deponent herein, having first

17                    been duly sworn on oath, was

18                    examined and testified as follows:

19                    MR. PARTRIDGE:  Your Honor, if we

20       may approach with the witness notebook?

21                    THE COURT:  Yes.

22       BY MR. PARTRIDGE:

23            Q.   Good morning, Mr. Schmidt.

24            A.   Good morning.
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1   Q.   We have an interpreter available

2   for you, Ms. Weisner, who is standing next to

3   you. If you have difficulty with my questions

4   or any questions you hear this morning and want

5   them translated into German, please ask her to

6   do so. I just ask that you have the entire

7   question translated if you have a question.

8   A.   Okay.

9   Q.   How do you feel about testifying

10   in English today?

11   A.   I'm a bit nervous today, because I

12   mean it is not my native language, but I will

13   try my best.

14   Q.   You testified in German at your

15   deposition and you're testifying in English

16   today. Why the change?

17   A.   I was not quite happy with the

18   situation at the deposition because these were

19   not really my words that were translated and I

20   prefer to try it in English this time.

21   Q.   Very well. What's your highest

22   level of education?

23   A.   Highest level of education is a

24   degree in computer science, which is similar to

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 1        a bachelor.

 2                Q.   How did you get interested in

 3        computers?

 4                A.   My first contact with computers

 5        was at school, the 11th grade, so when I was 16,

 6        17.

 7                Q.   You may want to move the

 8        microphone over just a little bit, make it

 9        easier for people to hear.

10                A.   Better?

11                Q.   Yes.  Did you take courses in

12        computer science?

13                A.   Yes, I take courses at school and

14        later at university, so computer graphics,

15        computer vision courses.

16                Q.   Have you read about computer

17        graphics as well?

18                A.   Yes, I read a lot about computer

19        graphics, so I was really excited about this

20        topic and wanted to know everything about it and

21        read a lot of books.  I have quite a nice

22        library.

23                Q.   Have you taught in the area of

24        computer graphics as well?
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1              A.   Yes, I taught computer graphics at

2       University of Art in Berlin.

3              Q.   Prior to graduating from the

4       university, did you do work in the area of

5       computer graphics?

6              A.   Yes, I did a lot of work.  So some

7       projects with some installations, I took part in

8       some exhibitions and I remember my first

9       commercial product was for a TV show, a game

10      show.

11             Q.   Who is your current employer?

12             A.   My current employer is HERE, a

13      company called HERE, so it's formally know as

14      Nokia HERE.

15             Q.   What do you do there?

16             A.   I am developing the search

17      software, I'm a senior manager of search

18      software.

19             Q.   Do you have other people reporting

20      to you?

21             A.   Yes.  My team is about thirty-five

22      people.

23             Q.   Would the jury perhaps know

24      something about HERE's products?  Can you tell
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 1        us a little bit about that and put it in

 2        context?

 3                A.   HERE first producing maps, street

 4        maps.  So four out of five navigation systems

 5        using our map data, so we're producing the maps

 6        and street maps.  And we also are developing a

 7        navigation software for cars and smart phone

 8        devices.  Maybe you know these application HERE,

 9        iPhone and Android.

10                Q.   Prior to working for HERE and

11        Nokia, where did you work?

12                A.   Prior?

13                Q.   Prior to HERE and Nokia, where did

14        you work?

15                A.   Prior to HERE and Nokia, I worked

16        for Gate 5.

17                Q.   What was Gate 5?

18                A.   Gate 5 is a spinoff of Art+Com

19        founded in the year 2000.

20                Q.   What did you do before Gate 5?

21                A.   Before Gate 5 I worked for

22        Art+Com.

23                Q.   From what time period?

24                A.   I started at Art+Com in '92,
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1   around '92.

2   Q.   When did you leave?

3   A.   I left in the year 2000.

4   Q.   During that period of time from

5   '92 to 2000, what was your role in general at

6   Art+Com?

7   A.   Oh, I had different roles at

8   Art+Com. So when I started as a student at

9   Art+Com, later I was a software developer and at

10   the end I was responsible for the software

11   development at Art+Com.

12   Q.   What did you get started with at

13   Art+Com when you first began, how did you get

14   started there?

15   A.   I remember when I joined Art+Com

16   as a student it was a funny situation. So I

17   came in and everybody already had a computer

18   there and I didn't have one. And at the same

19   time they arrived with huge box, huge like a

20   refrigerator. And when we unboxed this, this

21   was the Silicon Graphics reality engine and

22   somebody said why don't you take this as your

23   computer. And then I started on this very nice

24   Silicon Graphics computer as a student it was

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 1        very nice.  I had the biggest computer in the

 2        company.

 3                Q.   Was there a point in time when you

 4        began working on the T-Vision project?

 5                A.   Yes, I worked on the T-Vision

 6        project.

 7                Q.   What was your role on the T-Vision

 8        project?

 9                A.   So I was working on the rendering

10        part, so the part that visualized the data on

11        the screen, that was my part, the realtime

12        rendering.

13                Q.   You have a witness notebook in

14        front of you.  I'm going to refer to some

15        exhibits in the witness notebook and if you

16        would like to look at the exhibits in the

17        notebook, that's fine, but I'm also going to put

18        some up on the screen.

19                     Did you prepare some

20        demonstratives for purposes of your testimony

21        here today?

22                A.   Yes.

23                Q.   I would like to put up PTX 1.  Do

24        you recognize this document?
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 1                    A.   Yes.  This is our patent.

 2                    Q.   Do you understand that this is the

 3       '550 patent that is involved in this litigation?

 4                    A.   Yes.

 5                    Q.   Are you listed as an inventor?

 6                    A.   Yes, I'm listed as an inventor.

 7                    Q.   Are you familiar with this patent?

 8                    A.   No, I'm not familiar with this

 9       patent.  Fifteen years ago since I left Art+Com,

10       and I haven't read the patent.

11                    Q.   So it's been fifteen years since

12       you were at Art+Com and were familiar with this,

13       is that what you're saying?

14                    A.   Yeah.

15                    Q.   Do you have an understanding as to

16       what Art+Com projects are the subject matter of

17       the '550 patent?

18                    A.   Yeah.  The patent is about our

19       T-Vision product we developed end of '95.

20                    Q.   I would like to talk a little bit

21       about the T-Vision product.  What was the

22       computer, or the graphics computer you were

23       using for that project?  I said product, I meant

24       project.
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 1                      A.    We used Silicon Graphics computer.

 2                      Q.    Why was that?

 3                      A.    We use Silicon Graphics computer

 4      because they were the fastest computer for

 5      realtime graphics that were available at the

 6      time in the market.

 7                      Q.    At this point I would actually

 8      like you to look at one of the physical exhibits

 9      in your notebook.   Would you turn to PTX 299B

10      which is an English language translation of PTX

11      299A.   Do you have that in front of you, PTX

12      299B?

13                      A.    Yes.

14                      Q.    Great.   What is this document?

15                      A.    This is one of our milestones we

16      produced for our founder, Deutsche Telecom, at

17      that time for this project.

18                      Q.    Approximately what time period was

19      this document?

20                      A.    It looks like '95.

21                      Q.    Would you turn to -- we'll put it

22      up on the screen.   This will make it easier for

23      you.   I'm referring to page 87 of the document,

24      so if you want to look at the physical exhibit,
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 1        you may.  Do you see the slide in front of you?

 2                A.   Yes.

 3                Q.   This is one of the pages of the

 4        milestone report.  What is this slide

 5        describing?  I think we enlarged it for you a

 6        bit.

 7                A.   This describes the idea we had to

 8        start a new T-Vision from scratch, because the

 9        problem was with our demonstrator we used so

10        far, this was more like a research project, so

11        we tried something out, but the code base was

12        too bad, so we were not able to extend new

13        functionality to this project because it was

14        completely unstable sometimes and so we decided

15        to start a new system from scratch, rewriting

16        everything.

17                Q.   And this was in late 1994?

18                A.   Yeah, this was late 1995.

19                Q.   What were the major problems you

20        encountered with what you were doing prior to

21        this?

22                A.   We had several problems.  I

23        remember, so we had the first problem we had was

24        the limited texture memory on SGI machines we
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1   had at that time and we had a problem with the

2   number space of floating points.

3   Q.   I'd like to take those one at a

4   time and we've already had some testimony on it,

5   so we'll hopefully be able to fly through this a

6   bit. What was the texture memory problem?

7   A.   So the texture memory problem was

8   something we had to solve at the very beginning,

9   because so texture memory, it's a very special

10   memory. It's fast, it's very expensive at that

11   time and it's necessary to put the satellite

12   images on top of the geometry, so if you want to

13   see satellite images on the screen in realtime

14   on the topography, so you need this texture

15   memory. So on one hand we had a data base of

16   about 10 or 20 gigabyte of satellite images and

17   then we had these 64 megabyte of texture memory,

18   so this does not fit. And we had to find a

19   solution to use the huge amount of satellite

20   images with this small amount of texture memory.

21   So I developed a mechanism to use, to virtualize

22   the texture memory so that we have a three-level

23   texture paging from hard drive to main memory

24   and then from main memory to texture memory. So

435

```
 1        that for the renderer it looks like this more or

 2        less unlimited texture memory but internally it

 3        was paged between these three levels.

 4                Q.   How did this relate to realtime

 5        capability?

 6                A.   This was -- this was a cull

 7        functionality for rendering the earth in

 8        realtime, otherwise it's not possible.

 9                Q.   Did the SGI machine that you were

10        using for running the demonstrator have a

11        capability of doing this on its own?

12                A.   No.  This was not, not available

13        at the time.

14                Q.   As to the floating point number

15        problem you mentioned, what exactly is that?

16                A.   Floating point issue is another

17        thing.  So the SGI machines had just 32 bits for

18        storing floating point numbers and to address

19        all the coordinates we had in our world.  And if

20        you want to fly from outer space down to details

21        more than a meter or so, if you have some

22        buildings on top of the earth, so the number

23        space is not enough, you run out of these bits,

24        of these 32 bits, so objects start to jiggle and
```

1   dancing and so this is a problem we had.

2   Q.   Was this problem apparent to you

3   when you started the project and while you were

4   working on the project in the first couple of

5   years?

6   A.   No. We were not aware of this

7   problem, we just mentioned it when we started

8   the system for the first time, we saw these

9   dancing polygons there.

10   Q.   How did you solve the problem?

11   A.   We solved the problem with -- so

12   maybe I have to explain a bit the problem. So

13   it's a bit -- so it's like if you have a city,

14   let's say you have a city with 7-digit phone

15   numbers and so you have -- or with 7-digit of

16   phone numbers and so the city is growing and you

17   run out of phone numbers, so -- and you don't

18   want to add additional digits, so what you do is

19   you start introducing a new area code as a new

20   origin for a new area and then you have a new

21   number space, you can give out new numbers. So

22   and this is basically what we did, so we

23   introduced a new origin to have enough numbers

24   available to render the details we want to

1   render. And this we do dynamically. So we

2   introduced this dynamic coordinate system for

3   each frame, we calculate the optimal position

4   for this origin so that we have enough bits

5   available for floating point, so to render the

6   scene.

7   Q.   Was this problem complicated by

8   the fact that the user was moving?

9   MR. SNYDER: Objection, Your

10   Honor. Leading.

11   THE COURT: Overruled.

12   BY MR. PARTRIDGE:

13   Q.   Please, does -- was this

14   complicated in the situation where the user was

15   moving?

16   A.   Yes, this was complicated because

17   we have to recalculate for every frame when the

18   user was moving.

19   Q.   I'd like to turn to another

20   Exhibit, PTX-300A and B, which is I believe

21   another milestone report. I'm going to put a

22   slide up to make it easier for everyone. And

23   this is a slide from the first page of Exhibit

24   300B. What is Exhibit 300B?

438

```
 1                     A.   This is our milestone report.  The

 2         first milestone report from '96 for the new

 3         T-Vision project that we developed at that time.

 4                     Q.   I'd like to turn to Page 17 of

 5         300B and I think we have a slide on that.  What

 6         are you describing on this page?

 7                     A.   Here it's a description of the

 8         project status of the new T-Vision product

 9         development, so we described that we had started

10         the work and that we decided to use a platform

11         for this, so the decision was made that we

12         develop T-Vision on top of a platform that we

13         can also use for other projects within Art+Com,

14         so that we don't just, don't use it only for

15         T-Vision, also for other projects, because it's

16         platform Y15.

17                     Q.   And approximately when did that

18         development period start?

19                     A.   This start end of '95 and

20         continued in 1996.

21                     Q.   I'd like to change the subject

22         just a bit.  Have you heard of the idea of

23         spatially distributed data sources?

24                     A.   Sorry, I didn't hear the question.
```

439

```
 1                    Q.    In connection with the T-Vision

 2      project -- I'm sorry, I should move my

 3      microphone a little bit.

 4                          In connection with the T-Vision

 5      project, have you heard of an idea called

 6      spatially distributed data sources?

 7                    A.    Yes.

 8                    Q.    When do you believe that you had

 9      the idea of spatially distributed data sources?

10                    A.    So, I mean we had the vision of

11      the spatially distributed data sources from the

12      very beginning, so this was an idea we had,

13      yeah.

14                    Q.    If you had the vision of this from

15      the very early stages, why didn't you do

16      anything with it in those early stages?

17                    A.    So it was not so easy.  I mean, it

18      was a bigger problem to solve, and we simply

19      didn't have the time at the first stage.  We had

20      this demonstrator, as I said, this was for

21      everything new and we handled it like a research

22      project.  We were happy when we had the earth on

23      the screen and everything was working realtime,

24      and we dealt with it at sometimes, but this
```

440

```
 1     complex problem of distributed databases was not

 2     solved.

 3               Q.   Did this demonstrator ever, was it

 4     ever used to request data from spatially

 5     distributed data sources?

 6               A.   No.  It was technically not

 7     possible.

 8               Q.   Why was it technically not

 9     possible?

10               A.   Because we hadn't implemented

11     this.

12               Q.   I would like to talk about the

13     conference called Siggraph '95 conference.  Are

14     you familiar with something called Siggraph '95

15     conference?

16               A.   Yes, I'm familiar.

17               Q.   Did you attend that conference?

18               A.   Yes, I attended Siggraph '95.

19               Q.   Did Art+Com exhibit something at

20     that conference?

21               A.   Yes.  We showed our demonstrator

22     at Siggraph '95.

23               Q.   And that demonstrator had the

24     T-Vision software that you had available at the
```

441

```
 1        time?

 2                A.   Yes.

 3                Q.   Did the demonstrator request data

 4        from a plurality of spatially distributed data

 5        sources that you used at the Siggraph '95

 6        conference?

 7                A.   No.

 8                Q.   And why was that?

 9                A.   No, this was technically not

10        possible.  It was a demonstrator we used at

11        Siggraph '95.  So we start the data on the local

12        hard drive.

13                Q.   Did the demonstrator use a network

14        at Siggraph '95?

15                A.   No.  The demonstrator has not used

16        a network at Siggraph '95.

17                Q.   Was a network available at

18        Siggraph '95?

19                A.   Sure.  I mean, every booth had a

20        network connection there, yeah, this was

21        available.

22                Q.   If you were to assume that

23        computer you were using was plugged into the

24        network and you were running a T-Vision
```

```
 1        software?

 2                A.    Yeah, sure the computer was

 3        connected to the network.

 4                Q.    If you unplugged the computer from

 5        the network, what would happen with respect to

 6        the operation of T-Vision software?

 7                A.    Nothing would happen.  I mean, the

 8        software was running like before because, I

 9        mean, the data came from the local hard drive.

10                Q.    Do you recall if Art+Com

11        distributed any materials at Siggraph '95?

12                A.    No, not to my knowledge.

13                Q.    Do you recall seeing this document

14        that I'm about to put up on the screen at

15        Siggraph '95, DTX 1065?  Do you see it on the

16        screen?

17                A.    Yes.

18                Q.    Do you recall seeing this document

19        in this form at any time prior to your

20        deposition in this case?

21                A.    No, I don't recall.

22                Q.    Do you recall seeing this document

23        in this form or any other form including a

24        CD-ROM at Siggraph '95 itself?
```

```
 1                A.   No.

 2                Q.   I would like to turn to another

 3      exhibit which is PTX 304B which is the English

 4      language translation of 304A.  Do you have that

 5      up in front of you?  You can see it on the

 6      screen, Mr. Schmidt.  What is PTX 304B?

 7                A.   This is an E-mail I wrote to the

 8      whole Art+Com team after the exhibition in San

 9      Jose which was the 50th anniversary of ACM.  We

10      were invited, and this was the first time when

11      we showed our new T-Vision product at that

12      exhibition, '97.

13                Q.   I'm sorry, please complete your

14      answer.  I'm sorry.

15                A.   I'm ready.

16                Q.   Okay.  Very good.  The product

17      that you exhibited at this particular conference

18      was different than the demonstrator?

19                A.   Yes.  As I said, so this was the

20      first time we showed the new Y50 T-Vision

21      system.

22                Q.   What was the purpose in your

23      sending this E-mail?

24                A.   I wanted to say thank you to the
```

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1   whole team at Art+Com because they worked quite

2   -- I mean, at that time, already a huge team of

3   people contributed to this product. And so I

4   just wanted to say thank you because this was

5   hard work. And so we had a very good feedback

6   from the audience. I mean, we were even visible

7   at ABC in prime time, so this was a big success

8   for us, this exhibition.

9   Q.   The software that you used at this

10   particular exhibition at the ACM conference, did

11   it have the capability of working with spatially

12   distributed data sources?

13   MR. ALMELING: Objection, Your

14   Honor. Leading.

15   THE COURT: Overruled.

16   BY MR. PARTRIDGE:

17   Q.   You can answer the question. Did

18   you hear the question? Do you have it in mind?

19   A.   Yes, I understood the question.

20   So as I said, this Y50 system was,

21   we had the capability to use spatially

22   distributed data sources. Even though we hadn't

23   used it at this exhibition, technically it was

24   possible, the database was a complete rewrite

```
 1     and this was prepared for using data sources

 2     that were distributed?

 3            Q.   I would like to switch topics

 4     again and talk a little bit about SGI.  Do you

 5     remember working with people at Silicon

 6     Graphics?

 7            A.   Yes.  I remember some people at

 8     SGI, yes.

 9            Q.   Who do you recall?

10            A.   I remember Victoria Han.  She was

11     someone managing the demo center or covered

12     briefing center at Mount View.  And Michael

13     Jones, he was heading the performer team.

14     Performers, the graphic library from SGI we used

15     for T-Vision.

16            Q.   Was there a time when you worked

17     at the facilities of SGI?

18            A.   Yes.  We worked at SGI.  They

19     invited us in the summer of '95 before one of

20     the exhibitions we had in the US, and they

21     invited us for a couple of days.  We worked on

22     the machines at the demo center.

23            Q.   While you were there, did you

24     discuss what you were doing with anyone at SGI?
```

```
 1                    A.   Yes.   We discussed -- of course we

 2       showed our system and they wanted to have the

 3       system in that demo center and present to

 4       potential customer.  And I showed the system to

 5       Victoria Han of course and also Michael Jones.

 6                    Q.   Did Michael Jones say anything to

 7       you about the T-Vision system when he saw it?

 8                    MR. ALMELING:  Objection, Your

 9       Honor.  Hearsay.

10                    THE COURT:  Overruled.

11                    Q.   You may answer the question.

12                    A.   Yes.  So I mean, I remember his

13       reaction, he was really blowing away.  And he

14       said, wow, this is really something, my boss

15       really wants it from me.  And I said this is not

16       possible.  And so he was really, really very

17       excited about seeing what we did.

18                    Q.   That was your perception of the

19       interaction?

20                    A.   That was my perception.  Of course

21       I was very proud, of course, about the feedback

22       from him, because he was heading this performer

23       library.  It was one of the graphics gurus at

24       that time, so, yeah.
```

1   Q.   Did you ever speak privately with

2   Mr. Jones?

3   A.   I met him once. So he invited me

4   to his desk, it was when we were at the demo

5   center, and we had a talk at his desk about, of

6   course, our products, what I think, what I did

7   on top of the performer library to enable this

8   T-Vision system and he explained some details

9   about the upcoming versions of performer. And I

10   remember he had a very nice Indigo on his desk.

11   It was a brand-new machine at that time.

12   Q.   What did you tell him about what

13   Art+Com was doing in connection with T-Vision

14   that you recall?

15   A.   I explained to him how I solved

16   this texture paging problem, which was the

17   biggest issue at that time.

18   Q.   Do you remember exchanging e-mails

19   with Mr. Jones in that general time period?

20   A.   Yes, I exchanged several e-mails

21   with him.

22   Q.   I'd like to pull up PTX-298A and B

23   and this is the front page of 298B, which again

24   is the English language translation of 298A.

```
 1        What is this document?

 2               A.   This is the third milestone report

 3        we produced to Deutsch Telecom in June '95.

 4               Q.   Does this milestone report include

 5        copies of e-mails that you exchanged with Mr.

 6        Jones?  And to answer that question, maybe I

 7        should help you out as opposed to reading the

 8        document.

 9               A.   Yeah.

10               Q.   If you turn to Pages 69 through 70

11        of the document and we'll put that up on the

12        screen for you.

13               A.   Okay.

14               Q.   To make it easier, are these

15        e-mails that you exchanged with Mr. Jones?

16               A.   Yes, these are e-mails.

17               Q.   Okay.  I'd like to look at I think

18        it's the bottom, it's the bottom e-mail first.

19        What are you telling Mr. Jones in the

20        highlighted portion?

21               A.   I'm talking about this three-level

22        texture paging.  I explained what we have done

23        and then a bit about these asynchronous data

24        base paging and other stuff we had to do on top
```

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```
 1        of his Performer library to enable these

 2        realtime T-Vision system.

 3                   Q.   You appear to be making a request

 4        in here related to Performer 2.0.

 5                   A.   Yeah, I was asking -- sorry.

 6                   Q.   Go ahead.

 7                   A.   Yeah, I was asking about a beta

 8        version of the Performer 2.0 library because

 9        what we were using for the demonstrator was

10        Performer 1.2.  So as I said, I had to do

11        something on top of this library and I was

12        asking if this is -- if I can get an early

13        access to a new version.

14                   Q.   And what did Mr. Jones tell you in

15        response?  Put it back up, please.  There we go.

16        Okay.  We have it up on the screen.

17                   A.   Yep.

18                   Q.   What did he tell you in response?

19                   A.    He said yes, your project sounds

20        wonderful as a candidate for this beta program

21        and he's already asking on which media we want

22        to have it.  But it's a bit too early because

23        it's still in the alpha stage, but of course I

24        was very happy to be in this beta program for
```

```
 1        the Performer version.

 2                    MR. PARTRIDGE:  Thank you.  Pass

 3        the witness.

 4                    MR. ALMELING:  Your Honor, may we

 5        approach the witness with notebooks?

 6                    THE COURT:  Yes.

 7                    MR. ALMELING:  Your Honor, may I

 8        proceed?

 9                    THE COURT:  Yes.

10     BY MR. ALMELING:

11            Q.   I'd like to begin by talking about

12        a document that you discussed with your counsel,

13        specifically exhibit 298B, which you have in

14        front of you that I'd also like to place on the

15        screen.

16            A.   Okay.

17            Q.   Specifically I'd like to place on

18        the screen the third page, which is 16803.  Now

19        the date of this document is dated for the time

20        period October '94 through June '95.  That's

21        correct, right?

22            A.   Yes.

23            Q.   And this --

24            A.   May I?  What is this document
```

```
 1     about?

 2              Q.   You just finished discussing this

 3     document with your counsel.  This is Exhibit

 4     298B?

 5              A.   Do I have it here in my notebook?

 6              Q.   It was in the notebook that you

 7     were discussing with your counsel.

 8              A.   Okay.

 9              Q.   It's that last one that you were

10     talking about.

11              A.   Yeah.

12              Q.   I'm going to place it on the

13     screen, the one we're going to be talking about.

14              A.   Yeah.

15              Q.   This document covers the time

16     period October '94 to June '95, correct?

17              A.   Yeah, that's correct.

18              Q.   If you look a little bit further

19     down on that page under the authors, you are

20     named as one of the authors on this document,

21     right?

22              A.   Yeah.

23              Q.   And this document was published

24     about June 2005, right?
```

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```
 1              A.   Yeah.

 2              Q.   Okay.  I'd like for you to turn a

 3    couple pages forward in your notebook and I'll

 4    pull it up on the screen, specifically 16806.

 5    And under first section 1.1 is a sentence.  The

 6    first sentence reads, quote, the fact that, with

 7    today's technology, the photo realistic realtime

 8    visual display of a distributed data base of

 9    unlimited size is feasible and can be considered

10    to be the most important knowledge gained in the

11    course of the project to date.  The project in

12    this sentence refers to the ACI T-Vision

13    project, correct?

14              A.   Yes, we were talking about the

15    T-Vision project.

16              Q.   And using today's technology, a

17    distributed database of unlimited size is

18    feasible.  Today's technology refers to today,

19    which as of the date of this document is June

20    2005, right?

21              A.   Yes.  As I said, I mean we had the

22    distributed data base, that's correct.

23              Q.   I said 2005.  I think you and I

24    understood we were talking about 1995 when I
```

```
 1        said 2005, yes?

 2                A.   Yes.

 3                Q.   I'd like to talk a little bit more

 4        about your testimony about rendering and

 5        computer graphics description?

 6                A.   Yes.

 7                Q.   You're familiar with a concept of

 8        a quadtree, correct?

 9                A.   Yes.

10                Q.   A quadtree is a data structure

11        model of a representation of data; is that

12        right?

13                A.   Yeah.

14                Q.   And it's similar to a family tree

15        where you have a parent and a child and then

16        maybe grandchildren and so on.  You're familiar

17        with a family tree?

18                A.   I'm familiar with a family tree,

19        but a quadtree is a bit different.  The nice

20        thing with a quadtree is it's always divided

21        into four parts, so this is very simple data

22        structure, so it's very easy to use and very

23        easy to address a single tile in this quadtree.

24        A family tree might be a little bit different.
```

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```
 1                    Q.   A quadtree is not the only type of
 2         a tree structure for a data structure, is it?
 3                    A.   Sorry, I didn't hear the question.
 4                    Q.   The quadtree, that's not the only
 5         type of a tree data structure that exists,
 6         right?
 7                    A.   No, there are --
 8                    Q.   You're familiar with a binary
 9         tree, right?
10                    A.   Yes.
11                    Q.   A binary tree has two
12         subdivisions, correct?
13                    A.   Yes, always just two.
14                    Q.   And a quadtree, as you mentioned,
15         quad or four has four subsections, right?
16                    A.   Yes.
17                    Q.   You're familiar with an octree,
18         aren't you?
19                    A.   Yes.
20                    Q.   An octree, oct or eight, has eight
21         subdivisions, correct?
22                    A.   Right.
23                    Q.   People have been using quadtrees
24         and binary trees and octrees to store data for
```

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```
 1        decades, haven't they?
 2                A.   Yes.  We had to use octree at
 3        Art+Com for other projects, yes..
 4                Q.   And people have been using
 5        quadtrees and binary trees and octrees to store
 6        geographic data since the time before you filed
 7        for a patent in 1995, correct?
 8                A.   We used the quadtree for the
 9        T-Vision project, yes.
10                Q.   My question was slightly
11        different.  Before you filed for a patent people
12        had been using quadtrees to represent data,
13        correct?
14                A.   Yes.
15                Q.   And before you filed for your
16        patent, people had been using quadtrees to store
17        data in geographical information systems,
18        correct?
19                A.   At that time I was not aware of
20        this, I hadn't seen any systems.  I don't
21        remember systems that use quadtree data
22        structure.  Might be possible, but I don't
23        remember any of these systems.
24                Q.   So you weren't aware of any
```

1   systems before 1995 that used a quadtree to

2   store geographic data; is that right?

3   A.   No, I don't think so.

4   Q.   Okay. You didn't invent the idea

5   of using a quadtree to store geographic data,

6   did you?

7   A.   Sorry, again, can I hear the

8   question again?

9   Q.   Sure. You did not invent the idea

10   of using a quadtree to store geographic data,

11   correct?

12   A.   Well, this was not my invention, I

13   think.

14   Q.   In computer graphics people use

15   polygons to represent images, correct?

16   A.   Sorry, polygons to represent

17   images?

18   Q.   You're familiar with using

19   polygons to draw images in computer graphics?

20   A.   Polygons I use to draw geometry,

21   not images.

22   Q.   Correct. And drawing geometry

23   allows images to be displayed to screen?

24   A.   In the end it will be an image on

```
 1        the screen, sure, when it's projected to the

 2        screen, yes.

 3               Q.   And you're familiar with the term

 4        polygon grid model, correct?

 5               A.   Polygon grid model, yes, this is

 6        when you draw around something, you create a

 7        grid of polygons, yeah.

 8               Q.   You did not invent the idea of

 9        using a polygon grid model, correct?

10               A.   No.

11               Q.   I want to talk about the field of

12        geographic information systems, sometimes it's

13        known as GIS.  You're familiar with GIS;

14        correct?

15               A.   Yes, I know the term.

16               Q.   The field of GIS relates to using

17        computer systems to store, display or to do

18        other things with geographic data; correct?

19               A.   Yes.

20               Q.   And you're familiar with the term

21        virtual camera in the context of GIS systems;

22        correct?

23               A.   Virtual camera, what do you mean

24        by virtual camera?
```

```
 1                    Q.   You have not heard the term

 2         virtual camera?

 3                    A.   I have heard the term virtual

 4         camera, but it can describe different things.

 5         Camera position in the scene.  Of course it's a

 6         camera.  What is a virtual camera?  What do you

 7         mean by this?

 8                    Q.   So a virtual camera is a camera

 9         that allows the software to replicate the real

10         world experience of a camera, you're familiar

11         with that term virtual camera?

12                    A.   This is a virtual camera, in the

13         scene it's camera position, you can call it a

14         virtual camera.  It's like a camera, you can

15         define your point and you hit a view and you

16         detect a visual parts of the screen which would

17         be displayed on the screen.

18                    Q.   Determining a field of view for a

19         screen, that had been used before 1995 when you

20         filed a patent; correct?

21                    A.   Yes.

22                    Q.   You did not invent the idea of

23         using a field of view in a computer graphics

24         system?
```

```
 1                A.   No.
 2                Q.   And you didn't invent the idea of
 3      using a field of view in a geographic
 4      information system; correct?
 5                A.   No.
 6                Q.   I would like to talk about coarse
 7      to fine rendering which I presume you're
 8      familiar with, a type of rendering of going from
 9      a coarse image to a finer image.  You're
10      familiar with coarse to fine rendering; correct?
11                A.   Yes.
12                Q.   There are various ways of doing
13      coarse to fine images, there is not just one;
14      correct?
15                A.   Sure, there are different -- yeah.
16                Q.   And you did not invent every
17      possible way of using a coarse to fine
18      rendering; correct?
19                A.   I mean, part of our invention is
20      the way we zoom in from -- seamless zoom in from
21      outer space counsel to the details that are on
22      earth, down to meters, using the Quadtree data
23      structure.
24                Q.   My question was did you invent
```

1   every possible way of going from a coarse image

2   to a fine image?

3   A.   Every possible way? No.

4   Q.   I would like to move on and talk

5   about Siggraph which you discussed with opposing

6   counsel. Siggraph refers to a conference of

7   computer graphics; correct?

8   A.   Siggraph is a conference and

9   exhibition for computer graphics.

10   Q.   And it's held every year?

11   A.   Sorry?

12   Q.   It's held every year?

13   A.   At that time, yes, it was an

14   annual conference and exhibition.

15   Q.   Just so that we're all clear, when

16   we say Siggraph '95, it means the Siggraph

17   conference in 1995, that's your understanding;

18   correct?

19   A.   Yes, Siggraph conference and

20   exhibition '95, this is correct.

21   Q.   And you attended that conference?

22   A.   We attended the exhibition part of

23   this.

24   Q.   And you demonstrated the T-Vision

```
 1        project at that conference?

 2               A.   We demonstrated T-Vision, yes.

 3               Q.   And T-Vision is a computer

 4        visualization system so you demonstrated

 5        T-Vision on a computer; correct?

 6               A.   Yeah, we demonstrated at Siggraph

 7        '95 our T-Vision demonstrator at the exhibition.

 8               Q.   That computer that you

 9        demonstrated T-Vision on, that was connected to

10        the network; correct?

11               A.   As I explained before, the

12        computer, I'm sure the computer had a network

13        connection because every computer, every booth

14        there at the exhibition got a network connection

15        provided by the exhibition.  And we really

16        connected the computer to read our E-mails.

17               Q.   I have a question about Siggraph

18        '95, it's about SRI TerraVision.  ACI, they had

19        a booth that you were standing in and showing

20        the T-Vision project; correct?

21               A.   Yes.

22               Q.   Across the aisle from you was an

23        entity called SRI International; right?

24               A.   I have heard about this, yes.
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1              Q.   And they were directly across the
2      aisle from you in the convention center at
3      Siggraph '95, weren't they?
4              A.   I don't remember how we were
5      placed there or so, but yes, I remember the SRI
6      was also there, yes.
7              Q.   Mr. Ang, if you could please pull
8      up PTX 1, and specifically the second page.
9                   On the left, this is a copy of a
10     patent that you looked at a couple of minutes
11     ago.  And counsel highlighted the inventors and
12     he highlighted your name.  I would like to talk
13     about the other names on there.  You have three
14     co-inventors on the '550 patent; correct?
15             A.   Yes.
16             Q.   You were at Siggraph 1995;
17     correct?
18             A.   You.
19             Q.   You, Mr. Schmidt, were at Siggraph
20     '95?
21             A.   Yes, I was at Siggraph 1995.
22             Q.   And you saw SRI TerraVision at
23     Siggraph 1995?
24             A.   I don't remember seeing SRI at
```

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 1        Siggraph 1995.  Even though they were somewhere

 2        around, and I know from my colleagues they have

 3        seen this, but I don't remember seeing it.  As I

 4        said, we had this demonstrator and it was a very

 5        unstable system and I had a lot to do there, so

 6        I worked overnight to get the system running and

 7        I didn't have the time to walk around and look

 8        at the other exhibits.

 9                Q.   But you talked to your

10        co-inventors about SRI TerraVision system,

11        didn't you?

12                A.   They might have told me something,

13        yeah.

14                Q.   Mr. Mayer, another one of your

15        inventors, he told you about SRI TerraVision at

16        Siggraph '95, didn't he?

17                A.   It's possible.  I don't remember

18        the details, but it might be possible, yes.

19                Q.   Joachim Sauter is another

20        inventor, he was also at Siggraph '95 with you?

21                A.   Yes.

22                Q.   And he told you about SRI

23        TerraVision, didn't he?

24                     MR. PARTRIDGE:  Objection, Your
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 1        Honor.  Counsel is testifying rather than asking

 2        questions.  It's a 103(b) objection.

 3                    THE COURT:  Overruled.

 4               A.   I don't remember.

 5               Q.   Gerd Gruneis, he was with you, he

 6        was with you at Siggraph '95; correct?

 7               A.   Yes.

 8               Q.   And he told you about SRI

 9        TerraVision at that conference; correct?

10               A.   I don't remember.

11               Q.   In 2005 you were deposed in

12        Germany.  Do you recall that?

13               A.   Sorry, can you repeat the

14        question?

15               Q.   In 2005, you were deposed in

16        Germany; correct?  You had your deposition taken

17        in this case?

18               A.   In 2005?  I don't remember.

19               Q.   I missed a 1 in that one.  In

20        2015, you had your deposition taken, last year?

21               A.   Yes.  I had a deposition last

22        year, yes.

23               Q.   I apologize.  And there was a

24        court reporter present at that deposition?
```

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 1              A.   Yes.

 2              Q.   And you were placed under oath?

 3              A.   What.

 4              Q.   You were placed under oath similar

 5    to the oath that you took today?

 6              A.   Yes.

 7              Q.   I would like for you to turn,

 8    please, in the binder that I gave you, and

 9    specifically to page 196.

10              MR. PARTRIDGE:  Your Honor, I

11    object to this line of questioning.  There has

12    been no establishment of use for impeachment

13    purposes here, no inconsistency.

14              THE COURT:  Overruled.

15              Q.   Would you turn to that page?

16              A.   Sorry, again, which page?

17              Q.   196.

18              A.   From the --

19              Q.   No, the binder that I gave you

20    that had the deposition in it.

21              A.   Yes, I have the page here.

22              Q.   So let me ask you the question

23    again.  You heard from each of your three

24    co-inventors, Mr. Mayer, Mr. Sauter, and
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 1        Mr. Gruneis, and you obtained knowledge from

 2        them about SRI at Siggraph '95; isn't that

 3        right?

 4                    A.   As I said, I don't remember.

 5                    MR. ALMELING:  Your Honor, may I

 6        please read lines 196:22 through 197:3 into the

 7        record.

 8                    THE COURT:  Why don't you give the

 9        witness a moment to review it.

10                    THE WITNESS:  Yes, I recognize.

11                    THE COURT:  You can read it into

12        the record.

13     BY MR. ALMELING:

14                    Q.   "Question:  You said you obtained

15        knowledge regarding SRI from your colleagues.

16        Which colleagues?"

17                    End of question, to which you

18        answered:

19                    "Answer:  Gerd, Pavel, Joachim."

20                    Gerd refers to Gerd Gruneis?

21                    A.   Yes.

22                    Q.   And Pavel refers to Pavel Mayer?

23                    A.   Yes.

24                    Q.   And Joachim refers to Joachim
```

1   Sauter, doesn't it?

2   A.   Yes.

3   Q.   Earlier today you testified that

4   you're not very familiar with the '550 patent,

5   you haven't read it in fifteen years; is that

6   right?

7   A.   Yeah, I haven't read it after that

8   in detail. Also, I must say that the language

9   of the patent is more law language, so it's a

10   bit hard for me to understand.

11   Q.   The description that you were

12   given earlier did about what you were working

13   on, that was a description of the T-Vision

14   project, it wasn't a description of the patent;

15   correct?

16   A.   What I was describing, yes, was

17   what we had done when we developed the T-Vision

18   system.

19   Q.   I would like to talk about the

20   patent just for a minute now, and specifically

21   the patent application that you filed, or that

22   was filed on your behalf in 1996. As part of

23   that application, you filed a declaration;

24   correct?

```
 1                    A.   What -- can you ask the question

 2        maybe in different words.

 3                    Q.   Sure.   A declaration is a signed

 4        written statement by you?

 5                    A.   Okay.   I got it, yes.

 6                    Q.   You signed a declaration as part

 7        of the patent application you filed in 1996;

 8        correct?

 9                    A.   Yes.

10                    Q.   And in that declaration, you

11        acknowledged your duty to disclose material

12        information to the patent examiner; isn't that

13        correct?

14                    A.   Yes.

15                    Q.   At the time that you signed that

16        declaration, you of course knew about the

17        T-Vision project; correct?

18                    A.   Sure.

19                    Q.   You had been working on it for

20        years?

21                    A.   Sure.

22                    Q.   You did not disclose any

23        information about the T-Vision project,

24        specifically you did not disclose any videos of
```

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 1        the T-Vision project to the patent office, did

 2        you?

 3                  A.    No, not to my knowledge.

 4                  Q.    And you did not describe any

 5        articles that had been written about the

 6        T-Vision project to the patent office; correct?

 7                  A.    Yes, not to my knowledge.

 8                  Q.    And at that time, December 1996,

 9        you also knew about SRI TerraVision system

10        because it was after Siggraph '95; correct?

11                  A.    I mean, I said that my knowledge

12        about the SRI system was very little, so I

13        haven't seen this.

14                  Q.    And the knowledge that you had

15        about SRI's TerraVision project, you did not

16        disclose that to the patent office in December

17        1996; correct?

18                  A.    No.

19                  Q.    I want to ask a little bit about

20        your connection to the parties in this case.

21        You're a part owner of Art+Com AG, correct?

22                  A.    Yes.

23                  Q.    You own shares of stock in Art+Com

24        AG?
```

```
 1                    A.   Yes, as many others, I own around

 2         two percent shares of Art+Com.

 3                    Q.   In addition to Art+Com, you also

 4         own part of Plaintiff, correct?

 5                    A.   I also own around two percent of

 6         ACI.

 7                    MR. ALMELING:  No further

 8         questions, Your Honor.

 9      BY MR. PARTRIDGE:

10                    Q.   Mr. Schmidt, I'd like to clear up

11         a few things if I may.

12                    A.   Yeah.

13                    Q.   First of all, would you look at

14         Exhibit 298B in your notebook and turn to the

15         second page, excuse me, the page that's, Page 2

16         of the document.  I don't know if you're able to

17         pull it up on the screen.  Okay?

18                    A.   Yep.

19                    Q.   No, that's the wrong page.  To

20         make it fast, look in your notebook at Page #2,

21         which is ACI bates number 6803.  Sorry, it's

22         hard to see it up here.  Counsel referred you to

23         the date of this particular document, it's the

24         next page.  And the date is at the top of the
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 1        document.  Do you see that?

 2                A.   Yes.

 3                Q.   He referred to the date of October

 4        15th, 1994 through June 30th, 1995?

 5                A.   Yeah.

 6                Q.   And to the left that says report

 7        regarding the third project phase, correct?

 8                A.   Yes, this is correct.

 9                Q.   Was it possible to write this

10        report on June 30th, 1995 about this phase of

11        the project?

12                A.   No.

13                Q.   So is this report written at

14        sometime thereafter?

15                A.   No.

16                Q.   I'm sorry.

17                A.   Sorry, can you repeat the

18        question?

19                Q.   I said it too fast.  Was this

20        report written at sometime later than June 30th,

21        1995?

22                A.   No.

23                Q.   You may -- we may not be

24        communicating.
```

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 1                A.   Sorry.

 2                Q.   I had just asked you the question

 3      whether this report covered this time period.

 4      Remember that?

 5                A.   Yes.

 6                Q.   And then I asked you whether it

 7      was possible for a report covering this time

 8      period to actually be written on June 30th,

 9      1995?

10                A.   Now I got it.  Sorry.  Yes, of

11      course this covering a period that's correct

12      here.  And of course, I mean possible that we

13      have written the report a bit later, sure.

14                Q.   What was typical in writing these

15      milestone reports in terms of how long after a

16      project phase was completed that you wrote a

17      report?

18                A.   I mean, we were computer

19      scientists and we didn't like writing these

20      reports of course, but it was necessary of

21      course to get the funding from Deutsch Telecom

22      and we were always late with this.

23                Q.   The term publication was used in

24      the questions asked of you.  Who did you provide
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 1         this report to?
 2                   A.   We provide the report to?
 3                   Q.   Yes.  Who did you send it to?
 4                   A.   To Deutsch Telecom, so to the
 5         Berlin subsidiary of Deutsch Telecom.
 6                   Q.   Did you send it to anyone else?
 7                   A.   No, not to my knowledge.
 8                   Q.   I'd like you to pull up Page 195
 9         and 196, excuse me, it's Page 196 of your
10         depositions in the notebook given to you by
11         Google's counsel.
12                   A.   Yep.
13                   Q.   He pointed you to an answer to a
14         question in which you identified your colleagues
15         Gerd, Pavel and Jaochim, but he didn't ask you
16         about the follow up question that completed your
17         discussion.  The next question is what did they
18         tell you regarding SRI and what answer did you
19         give?
20                   A.   I don't remember in which context,
21         but I assume that they had a closer look at it
22         at some point in time.
23                   Q.   And that appears on Page 197 of
24         your deposition?
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 1                    A.   Yep.

 2                    Q.   And then he says the next question

 3       is what else did they tell you about SRI's

 4       TerraVision.  Do you see that at lines 9 and 10?

 5                    A.   Yep.

 6                    Q.   And how did you answer?

 7                    A.   I don't -- I don't remember

 8       anything further apart from what I've already

 9       said.

10                    MR. PARTRIDGE:  No further

11       questions, Your Honor.

12                    MR. ALMELING:  No further

13       questions, Your Honor.

14                    THE COURT:  I have one question

15       I'd like to ask of the witness to clarify the

16       record.  And what is the exhibit number, Mr.

17       Partridge, of the report that you were showing

18       him?

19                    MR. PARTRIDGE:  I'm sorry, I

20       couldn't hear you, Your Honor.

21                    THE COURT:  What is the exhibit

22       number of the report that you were discussing

23       with him, the one that ended in June 30th, 1995?

24                    MR. PARTRIDGE:  298B, B as in boy.
```

```
1                    THE COURT:  With respect to this

2       Exhibit 298B, can you tell us approximately when

3       this report was written?

4                    THE WITNESS:  So this was the

5       third milestone in June '95 and slightly after

6       this date, maybe, but later than June and also

7       in the time period, so it was a period of time.

8                    THE COURT:  Matter of months,

9       weeks?

10                   THE WITNESS:  Maybe two months for

11      this milestone.

12                   THE COURT:  Okay.  Thank you.

13      Does counsel have any more questions?

14                   MR. PARTRIDGE:  No further

15      questions, Your Honor.

16                   MR. ALMELING:  No, Your Honor.

17                   THE COURT:  And now is the

18      opportunity for the jury to see if it has any

19      questions for the witness, so each of you either

20      write a question or pass a paper along or pass a

21      blank piece of paper along so the courtroom

22      deputy can collect.

23                   Mr. Schmidt, we give the jury an

24      opportunity to ask questions if they have any.
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 1                    THE WITNESS:  Okay.

 2                    THE COURT:  The jury has no

 3     questions, so the witness is excused.  Is the

 4     witness subject to recall?

 5                    MR. SNYDER:  Yes, Your Honor.

 6                    THE COURT:  Okay.  Thank you, Mr.

 7     Schmidt.  For the moment you're excused.  Mr.

 8     Partridge.

 9                    MR. PARTRIDGE:  Yes, I'd like to

10     offer Exhibits PTX-298A and B, PTX-299A and B,

11     PTX-300A and B, PTX-304A and B.

12                    THE COURT:  Any objections?

13                    MR. ALMELING:  No, Your Honor.

14                    THE COURT:  Okay.  The exhibits

15     are received in evidence.

16                    MR. PARTRIDGE:  Thank you.  Sorry,

17     Your Honor.  Trying to preserve our time,

18     perhaps a little too much.  We would like to

19     call Mr. Evan Parker by deposition.  In this

20     instance we need to read the deposition, do it

21     the old fashion way, Your Honor.  The video for

22     this deposition was malfunctioned and we aren't

23     able to play it.  Parts of it for some reason

24     didn't function when the deposition was taken.
```

1   So to read the deposition into the record, we'll

2   ask one of my colleagues, Mr. Silliman to take

3   the witness stand and Ms. Michelle Eber to read

4   the questions that have been designated by both

5   sides and the answers of course for this

6   individual.

7   THE COURT: Okay. Thank you. So

8   the jury understands, normally there's video of

9   depositions. That's not available now, so we're

10   going to have to read the transcript that was

11   made from the deposition at the time.

12   MR. PARTRIDGE: And a brief

13   introduction, Your Honor. Mr. Parker is a

14   software engineer with Google. He'll testify

15   about Google Maps with Earth and something

16   called Globe as well.

17   MS. EBER: May I approach, Your

18   Honor.

19   THE COURT: Yes.

20   BY MS. EBER:

21   Q.   Would you state your name for the

22   record, please?

23   A.   Evan Parker.

24   Q.   Mr. Parker, Exhibit 1 is a video

```
 1        with the or produced in this case with bates

 2        number ACI 0011187 and I'd like for you to watch

 3        that video and then I'd like to ask you a few

 4        questions on it, okay?  For the record, it's PTX

 5        142.  Is that okay for the record?

 6                  A.   Yes.

 7                  Q.   Mr. Parker, do you recognize the

 8        video that we just watched that's marked as

 9        physical Exhibit 1?

10                  A.   I do.

11                  Q.   And what is it?

12                  A.   It was a presentation that I and

13        Janne Kontkanen gave at SIGGRAPH last year.

14                  Q.   And was that an approximation on

15        how Google Maps with Earth worked as of that

16        time to your knowledge?

17                  A.   It's a very high level

18        approximation of how it works.  We left out a

19        lot of detail and a lot of complexity.  As you

20        can probably see from the presentation itself,

21        it was already very complex.  We had only 40

22        minutes to describe it, but our goal was a high

23        level overview of interest to the graphics

24        community.
```

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 1                       Q.   And do you recall any of the

 2       detail or complexity that you left out?

 3                       MR. SILLIMAN:  Sorry, I think we

 4       had a mix up on the presentations.

 5                       MS. EBER:  May I approach, Your

 6       Honor?

 7                       THE COURT:  Yes.

 8                       THE WITNESS:  To some extent.  I

 9       would have to refer to the code to know the

10       differences between what we discussed and what

11       the code actually implements.

12    BY MS. EBER:

13                       Q.   So are there any differences that

14       you're aware of sitting here between the

15       presentation and how the code actually works?

16                       A.   I know of many significant

17       differences, but again, to refer to any specific

18       one I would have to look at the code.  I know

19       that we intentionally left out big parts, a lot

20       of complexity, a lot of details.

21                       Q.   Okay.  And can you tell me at a

22       high level what was intentionally left out?

23                       A.   Again, I would have to refer to

24       the code.
```

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```
 1              Q.   And so sitting here, you have no

 2      recollection of what was left out of this

 3      presentation?

 4              A.   Again, I'd have to refer to the

 5      code.

 6              Q.   Thank you.  So Mr. Parker, do you

 7      currently work for Google?

 8              A.   I do currently work for Google.

 9              Q.   And which facility do you work at?

10              A.   I work in the Mountain View

11      office.

12              Q.   And what is your title or position

13      there?

14              A.   I'm a staff software engineer.

15              Q.   So with respect to those topics

16      you're here for, as your counsel said, new

17      Google maps flow; is that correct?

18              A.   Correct.  That is my area of

19      expertise, Earth and the new version of maps at

20      Google.com.

21              Q.   What do you recall about system,

22      the system data flow diagram slide as you sit

23      here?

24              A.   I can picture in my mind several
```

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 1        boxes.  The data flow is roughly from a -- from

 2        a -- from the perspective of a client requesting

 3        data, sending the data, requesting the data,

 4        receiving the data from the client, transferring

 5        the data to a web worker, decoding the data,

 6        transferring it back to the main thread,

 7        uploading that data to the GPU memory at which

 8        time the data is rendered.

 9                Q.   Are you familiar with the term

10        cull, C-U-L-L?

11                A.   I'm familiar with it, but there is

12        various meanings.  What particular meaning do

13        you have in mind?

14                Q.   Do you know -- how many meanings

15        are you aware of of cull?

16                A.   To cull, to remove, sort of a

17        generic English meaning.

18                Q.   So in the context of computer

19        graphics generally, do you have an understanding

20        as too, sorry, the meaning of cull?

21                A.   Sure.  In computer graphics cull

22        is often used, for example, in video games to

23        mean to remove or perhaps the inverse to select

24        the things to draw.
```

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1   Q.   To your knowledge is culling used

2   in globe?

3   A.   The word we used generally is in

4   the code and in globe is to select the nodes to

5   render, similar to the concept of culling.

6   Q.   And earlier you had -- when you

7   were explaining traversal at a high level, you

8   mentioned that globe examines metadata which may

9   include a bounding box and context and

10   application stage; is that correct?

11   A.   Uh-huh.

12   Q.   How about the view, in other words

13   where the camera is and the resulting view, when

14   I say that, are you familiar with what I'm

15   talking about?

16   A.   I would use the word frustum.

17   That's the word we used in the presentation.

18   Q.   Okay.   What's your understanding

19   of frustum?

20   A.   Frustum is -- can be thought of as

21   in one instance, can be thought of as a sort of

22   pyramid region of space with potentially caps on

23   the top and bottom of the pyramid.

24   Q.   How is the concept of the frustum

1   used in globe?

2   A.   We used it to select what node

3   data instances to render and also to decide what

4   metadata and data to fetch and to load into GPU

5   memory.

6   Q.   I would not ask for an explanation

7   on those transformations, but can you tell me

8   where, if at all, transformations between

9   coordinate systems are used in globe?

10   A.   All over the place. I would have

11   to look at the code to show you those places,

12   but it's literally practically every file.

13   Q.   And to your understanding, does

14   globe have data on, for instance, the buildings

15   within a node stored as world coordinates?

16   A.   No, they are stored in node

17   coordinates.

18   Q.   Do you have an understanding as to

19   why that's the case?

20   A.   I do have a high level

21   understanding that I can provide.

22   Q.   Sure. And what is that, please?

23   A.   It comes back to the size of data.

24   So if you use, say, if you represent all your

484

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 1        data in world coordinates, world coordinates

 2        have a precision requirement of being able to

 3        represent things from the scale of the earth

 4        down to say sub millimeter, you know.  You want

 5        to be able to represent a spec of dust all the

 6        way to the size of the earth, which means you

 7        got to represent -- you got to have enough bits

 8        of precision to be able to represent large

 9        things and small things.

10                Q.   Sure.

11                A.   So 32 bits is sort of barely

12        enough to get centimeter resolution on the

13        surface of the earth because the earth is

14        approximately 40,000 kilometers in diameter,

15        that's two to some large power, two to -- I have

16        done the math previously, I would have to go

17        back and look at my math, but it's 32 bits of

18        precision you can represent points on the

19        surface of the earth at centimeter resolution.

20        We want to do better than that, so you probably

21        need higher than that, 64 bits of precision.

22                     In the case of a node which

23        represents a bounded region in space at some

24        resolution, you don't need to fit a world into
```

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1   that node. You don't need to fit a world into

2   that node at nanometer resolution, you only need

3   to fit a building into it at meter resolution.

4   So you can use a much lower precision, let's say

5   for example, half, say use 32 bit precision

6   instead of 64 bit precision.

7   And that means that the each point

8   on the triangle would be 32 bits instead of 64

9   bits, so it's half the size of the data if you

10   were to store it in world coordinates.

11   So by using the lower precision,

12   we can save on storage costs and bandwidth costs

13   and the amount of memory it takes when we load

14   it into memory on a computer.

15   Q.   Okay. And if you could take -- go

16   two slides further there is a slide that says

17   rendering overview. Is this to your

18   understanding a high level description of the

19   rendering that takes place in globe?

20   A.   This is not just about rendering,

21   it's also about requesting, requesting metadata

22   and data, but it also does include rendering,

23   yes.

24   Q.   Okay. And the requesting also

```
 1        relates to globe; is that true?

 2                A.   Yes.

 3                Q.   Right.  Okay.  And so let's just

 4        look at the first one, then.  When -- so the

 5        first bullet point says traverse nodes in the

 6        view frustum, do you see that?

 7                A.   Yes.

 8                Q.   Do you have an understanding of

 9        what that means?

10                A.   At a high level.

11                Q.   Okay.  And what is your high level

12        understanding of that?

13                A.    It's talking about traversing the

14        metadata, meaning examining various pieces of

15        metadata and it is considering metadata that is

16        within the view frustum, meaning metadata that

17        has bounding boxes that intersect the view

18        frustum.

19                Q.    And then in the second bullet it

20        says starts from the root node and traverse to

21        the target quality.  Do you see that?

22                A.   Yes, I see that.

23                Q.   Do you have an understanding of

24        what that means?
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 1              A.   Give me a second to read it and

 2       think.

 3                   Yes.  Yes, I understand that.

 4              Q.   And what does that mean to you?

 5              A.   So we have got a tree of metadata

 6       and the traversal starts at the root node and

 7       traverses, in other words visits each node in

 8       this tree of metadata in imagery quality order

 9       per bullet point and it stops, the various

10       reasons the traversal was stopped.

11                   One of them is that it has reached

12       a point in the tree where the imagery quality of

13       that, of the node represented by that metadata

14       is equal to or greater than the target imagery

15       quality.

16              Q.   Fair enough.  And then on the next

17       slide titled sufficient imagery quality levels,

18       can you explain your understanding of this to

19       the extent you have one?

20              A.   Sure.  There is three pictures on

21       this slide.  The left one says quarter quality

22       and is blurry to the visible eye.  The second

23       one is titled half quality, and it would be

24       blurry to the visible eye if this printer was
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 1        better.  And the third one is target quality

 2        which should not be blurry at least to the

 3        limits of the resolution of the display, in this

 4        case a printer, which is not very good.

 5                    Q.   Sure.  And a screen shot?

 6                    A.   Yeah.  So this is just showing

 7        different levels of imagery quality and saying

 8        that we consider these three levels of imagery

 9        quality sufficient, we just need to define we're

10        using an English word sufficient here and saying

11        it's sufficient imagery quality levels would be

12        these three.  We could have picked four, we

13        could have picked two, we could have picked ten.

14        They are close to the target quality.

15                    MS. EBER:  That concludes the

16        deposition, Your Honor.  The plaintiffs would

17        like to move into evidence PTX 142.

18                    THE COURT:  Any objection?

19                    MR. SNYDER:  Was that 214 or 142.

20                    MS. EBER:  142.

21                    MR. SNYDER:  No objection, Your

22        Honor.

23                    THE COURT:  It's admitted into

24        evidence.  And members of the jury, since this
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 1        is not a real witness, there is no opportunity

 2        to question further.

 3                    Thank you.  Mr. Partridge.

 4                    MR. PARTRIDGE:  Yes, Your Honor.

 5        For our next witness, we call this time video

 6        testimony Mr. John Rohlf.  He's a senior staff

 7        engineer at Google testifying about the

 8        operation of Google Earth products.

 9                    This is very, very short.  So you

10        don't have much time to watch it.  It's about

11        two minutes.

12                    (Videotape deposition)

13            Q.   Good morning.  Please state your

14        name for the record.

15            A.   John Rohlf.

16            Q.   What is your current title or

17        position with Google?

18            A.   I'm a senior staff engineer.

19            Q.   And prior to your two years

20        working on the next generation maps API, what

21        products or platforms were you responsible for?

22            A.   I was responsible for Google Earth

23        Client.

24            Q.   Okay.  Is there a specific year
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 1        that you recall having responsibilities for

 2        another product or platform?

 3                A.   I have been the Google Earth

 4        technical lead for ten years, I think.  10ish

 5        years.

 6                Q.   Okay.  When you refer to the tech

 7        lead for Google Earth Client, does that include

 8        the Google Earth Client on all platforms for

 9        which Google Earth is offered?

10                A.   My focus was primarily on the core

11        of Google Earth Client.

12                Q.   So by core, do you mean code that

13        might be shared across different platforms?

14                A.   Yes.

15                     (End of videotape deposition.)

16                     MR. PARTRIDGE:  There are no

17        exhibits associated with that videotape

18        deposition, Your Honor.  And for our next

19        witness, we call Dr. Ken Castleman.  And

20        Mr. Spears will handle the examination.

21                     MR. SPEARS:  Your Honor, I notice

22        we're at about 10:20.  I expect the direct

23        examination to go about ninety minutes.  We can

24        break now or get out of the background and then
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 1        break at that point.

 2                     THE COURT:  Why don't we move

 3        forward.  It's a little early.

 4                     MR. SPEARS:  Fair enough.

 5                     And a brief transition while we're

 6        getting all these exhibits out.

 7                     THE CLERK:  Can you please state

 8        and spell your full name for the record.

 9                     THE WITNESS:  My name is Kenneth

10        R. Castleman, C-A-S-T-L-E-M-A-N.

11

12                     KENNETH R. CASTLEMAN,

13              the deponent herein, having first

14                 been duly sworn on oath, was

15                 examined and testified as follows:

16                     MR. SPEARS:  And while we're

17        handing out this notebook, members of the jury,

18        Dr. Castleman is an expert in the field of

19        computer graphics and digital imaging

20        processing.  And he's here today to talk us

21        through the asserted claims of the patent and to

22        line them up against products that are at issue

23        in this case.

24                     MR. SPEARS:  Are we ready to
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 1        proceed?

 2                     THE COURT:  Yes.

 3                     MR. SPEARS:  Very well.

 4                     DIRECT EXAMINATION

 5    BY MR. SPEARS:

 6             Q.   Good morning, Dr. Castleman.

 7             A.   Good morning.

 8                     MR. SPEARS:  May I approach the

 9        witness?

10                     THE COURT:  Yes.  Why don't the

11        counsel in the case of each witness introduce

12        themselves.  The witness may already known you,

13        but the jury may not.

14                     MR. SPEARS, my name is Gene Spears

15        and I'm one of the attorneys representing

16        plaintiff, ACI.

17    BY MR. SPEARS:

18             Q.   And Dr. Castleman, I'm handing you

19        what's been identified as Plaintiff's Trial

20        Exhibit 366.  Can you tell us what this is?

21             A.   Yes.  This is a textbook that I

22        wrote and published in 1996 entitled Digital

23        Image Processing.

24             Q.   How and where is this textbook
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 1        used, Dr. Castleman?

 2                A.    This books is used as a textbook

 3        in graduate and undergraduate courses in

 4        computer science and image processing, computer

 5        science and electrical engineering courses that

 6        are concerned with digital image processing.

 7                Q.    Is it only used in the United

 8        States for that purpose?

 9                A.    No, this book has been translated

10        in Japanese and Chinese.  And it's also

11        available as a paperback in India in English.

12        And it's used in courses all over Europe and the

13        United States.

14                Q.    Have you personally taught these

15        types of courses?

16                A.    Yes, I have.  I have taught short

17        courses around the country and I also taught a

18        course on image processing at Cal Tech.

19                Q.    Have you personally supervised the

20        development of image processing applications?

21                A.    Yes, I have.  When I worked for

22        NASA at the jet propulsion laboratory, I

23        supervised the early development of a computer

24        controlled microscope that was eventually landed
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 1        on Mars.

 2                    And then after I left JPL, I

 3        started my own company and we developed image

 4        processing systems that were used in genetics

 5        laboratories, medical labs all over the world.

 6        And I was the chief technical officer for that

 7        company.

 8              Q.   Have you received any awards or

 9        recognition for your work in this area?

10              A.   Yes, I have.  I am a fellow of the

11        American Institute of Medical and Biological

12        Engineering.  And I am in the Space Technology

13        Hall of Fame.

14              Q.   Have you ever been retained by the

15        patent office to assist them as an expert

16        witness?

17              A.   Yes.  I'm currently working for

18        the US Patent Office to assist them in defending

19        the patent office in a lawsuit in federal court.

20              Q.   Could you open the notebook that's

21        been placed in front of you and turn to tab 1.

22        What is this?  What are we looking at,

23        Plaintiff's Trial Exhibit 1.

24              A.   This is the '550 patent, the one
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 1        that is at issue in this case.
 2                Q.   And have you formed any opinions
 3        as to whether Google infringes this patent?
 4                A.   Yes, I have.
 5                Q.   What have you concluded?
 6                A.   My studies showed that the Google
 7        products that are accused in this case infringe
 8        four of the claims of the patent, namely claims
 9        1 and 3 and 14 and 28.
10                Q.   How long have you spent analyzing
11        these issues?
12                A.   I spent approximately 250 hours on
13        this study.
14                Q.   And what did you spend those 250
15        hours doing?
16                A.   I reviewed the patent and its
17        prosecution history.  I also reviewed documents
18        that describe the operation of the Google
19        products.  I reviewed deposition testimony given
20        by Google employees who were explaining how
21        these products work.  And I reviewed the source
22        code that actually runs on the users' devices
23        when they're using Google Earth and then my own
24        experience operating Google Earth myself.
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1                    Q.   What is source code, Doctor

2         Castleman?

3                    A.   Source code is the computer

4         program that's actually runs on the computer.

5         It's written in a language that both the

6         programmers and the computer can understand.

7                    Q.   And of you prepared demonstrative

8         exhibits in which you excerpted and highlighted

9         the source code you wanted to talk about today?

10                   A.   Yes, I have.

11                   Q.   And we'll get to that later?

12                   A.   Referring back to the '550 Patent,

13        does this patent, in your view, solve a problem

14        in digital image processing.

15                   A.   Yes, it does.

16                   Q.   What is that problem?

17                   A.   This patent solves a problem of

18        how you can display the entire planet earth on a

19        computer that's small enough to fit in a cell

20        phone and you can fly over the planet and visit

21        any place you want to go and look at it from a

22        distance or up close and this patent solves that

23        problem.

24                        MS. WILLIAMSON:  Objection, Your
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 1        Honor.  Beyond the scope of the expert's

 2        opinion.  He didn't ever view any demonstration

 3        of the patented technology.

 4                    MR. SPEARS:  His expert report

 5        clearly says he's going to rely upon patented

 6        technology.  May we have a side bar?

 7                    THE COURT:  The objection is

 8        overruled.

 9   BY MR. SPEARS:

10             Q.   Going on.  When was the first time

11        that you personally reviewed this patent?

12             A.   That was about two years ago when

13        I was contacted about working on this case.

14             Q.   And at that time were you familiar

15        with Google Earth?

16             A.   Yes, I was.  I had used it.

17             Q.   And the first time that you

18        reviewed this patent, what initial impressions,

19        if any, did you form?

20             A.   I remember when I first used

21        Google Earth I have an appreciation for how much

22        data is required to store pictures of the entire

23        surface of the planet at high resolution.  It's

24        a huge amount of data.  And when I first saw
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1   that you could do that on of all things a

2   smartphone, my first thought was how in the heck

3   did they do that? And when I read this patent,

4   I realized yes, that's the way you would have to

5   do it.

6   Q.   And is that why you concluded that

7   Google Earth infringes?

8   A.   No, that was a result of my

9   analysis.

10   Q.   Okay. And for purposes of this

11   analysis, did you divide Google's products into

12   groups?

13   A.   Yes, I divided them up into three

14   groups, because these three groups of products

15   use slightly different software, so I considered

16   them one group at a time.

17   Q.   And does the slide in front of the

18   jury now reflect that division that you made?

19   A.   Yes, that shows the three groups

20   that I used.

21   Q.   Could you talk us through these

22   three groups of products, please?

23   A.   Okay. The products that I called

24   Group I run the latest version of Google Earth

1   Version 8, which also goes under the name Mirth.

2   And that runs on the Android smartphones. Group

3   II is earlier versions of Google Earth, 7 and

4   earlier that go back to 2008. That also

5   includes the enterprise version of Google Earth,

6   the one that runs on Androids and on the Apple

7   smartphones and also runs on Audis, the

8   automobiles that come with Google Earth

9   installed.

10   Q.   What about Group III?

11   A.   Group III is for desk computers.

12   It's the new version of Google Maps which has

13   Google Earth built in.

14   Q.   Have you prepared a video

15   demonstrating your recent operation of Google

16   Earth?

17   A.   Yes, I have.

18   Q.   If we could play that video and

19   could you talk us through what we're looking at?

20   A.   This is the opening screen from

21   Google Earth and what I did here was I clicked

22   on Berlin and Google Earth spun the globe and

23   placed me looking down at Berlin, then I clicked

24   on Kaiser Wilhelm Church and Google Earth zoomed

1   in on that building, what is the Kaiser Wilhelm

2   Memorial Church and then I clicked on another

3   position to be able to look at the church from

4   the east side and Google Earth spins around and

5   gives me a view of what that church looks like

6   from the east.

7   Q.   Thank you, Doctor Castleman.

8   Let's move from this video and go directly to

9   Claim 1. And here we've presented a claim

10   broken up into various segments and the first

11   segment is the top. What is the name for that?

12   A.   I'm sorry, can you stand a little

13   closer to the microphone, please and give me

14   that one again?

15   Q.   Yeah. Certainly I can do that,

16   sir. That paragraph at the top, what's that

17   refer to?

18   A.   That paragraph is called the

19   preamble to the claim. It gives us an overview

20   of what this claim covers.

21   Q.   And what relationship, if any, is

22   there between this preamble and what we saw you

23   doing in this video?

24   A.   Well, the preamble basically

501

1   describes the process that Google Earth goes

2   through in order to do what I showed on the

3   video.

4   Q.   And how does it do that?

5   A.   Well, first off it provides a

6   pictorial representation, that's the picture on

7   the screen, of space-related data, that's all

8   those images of the earth that go to make up

9   that picture, of a selectable object, that's the

10   earth. And the representation that it shows

11   corresponds to a view of the object by an

12   observer with a selectable location. In other

13   words, wherever I choose to place my viewpoint

14   above the planet, that's the selectable

15   location. And the selectable direction of view

16   you saw that by being able to look at the church

17   from different angles.

18   Q.   And what is it that makes that

19   location selectable?

20   A.   The Google software that's running

21   on the desktop, laptop or smartphone in response

22   to input from the user the Google software makes

23   that selection of location and direction of

24   view.

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 1              Q.   Does it also make the object

 2      selectable?

 3              A.   It does, it makes it selectable.

 4              Q.   And is that true for all three

 5      groups of products that you considered?

 6              A.   Yes, they all do that.

 7              Q.   So insofar as you're concerned, do

 8      all three products do what's in this preamble?

 9              A.   Yes, they do.

10              Q.   So can we check this off for all

11      three groups of products?

12              A.   Yes, we can check those off.

13              Q.   Okay.  Let's move on from the

14      preamble to Step A, providing a plurality of

15      spatially distributed data sources for storing

16      space-related data.  Has this language received

17      a construction by the Court?

18              A.   Yes, this language has been

19      construed by the Court.

20              Q.   And what is that construction?

21              A.   The Court determined that that

22      phrase means a plurality of geographically

23      separate data sources and a plurality means two

24      or more.
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1   Q.   And can you describe how this is

2   done in a graphic? Have you prepared a graphic

3   to do this?

4   A.   Yes, I have.

5   Q.   Okay. What are we seeing here?

6   A.   What we see here is a smartphone.

7   The idea is, as I mentioned earlier, the amount

8   of data required to show pictures like this of

9   the earth is absolutely huge. And if you tried

10   to put all that data on your smartphone, you

11   would fill up the memory long before you got the

12   entire earth stored. So that is just not a

13   practical way to do this.

14   Q.   Going on, do you have a graphic

15   that shows how Step A is part of the solution to

16   this problem?

17   A.   I do, yeah. This shows how the

18   data is actually stored according to the patent.

19   The large amount of data required for the earth

20   is actually stored in separate locations on very

21   large computer centers. These are data centers

22   that have a number of computers that store all

23   this data that's required to make these

24   pictures. And they are connected to the

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 1        internet so that smartphones and desktop

 2        computers can access the data over the internet

 3        as it is needed.

 4                Q.   Now, the word plurality, that's

 5        just kind of legal ease for more than one?

 6                A.   It is.

 7                Q.   And does Google support its earth

 8        applications with data in more than one data

 9        center?

10                A.   Yes, as a matter of fact, this

11        graphic shows the location of the four Google

12        data centers that are located inside the United

13        States.

14                Q.   Could you turn to Plaintiff's

15        Exhibit 133?

16                A.   Okay.

17                Q.   What is this?

18                A.   This is a Google document entitled

19        Production Design Document for Google Earth.

20                Q.   And we may have lept ahead of

21        ourselves by going to Page 18 of that document,

22        which I'd invite you to do?

23                A.   All right.

24                Q.   We can catch up and get page 18 up
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1   on the screen. There we go. Near the middle of

2   the page, what, if anything, does the document

3   indicate about the data centers that Google is

4   using to support Google Earth?

5   A.   We see here under this heading,

6   machines and data centers, a list of the nine

7   data centers that Google maintains around the

8   world, four of which are located in the United

9   States.

10   Q.   And are those data centers, are

11   they used to support all three groups of Google

12   Earth products?

13   A.   Yes, products from all three of

14   the groups would receive their data from one or

15   more of these data centers.

16   Q.   So I would like to take us to the

17   claim 1 checkbox. Can we go ahead and check off

18   step A with respect to the each of the three

19   groups of Google products?

20   A.   Yes, that one is actually done.

21   Q.   Now, moving on from step A, step B

22   of claim 1 requires that we determine a field of

23   view that includes certain items that we're

24   going to speak about in more detail.

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 1                    Do you have a graphic that

 2    generally illustrates what this step is talking

 3    about?

 4              A.   Yes, I do.

 5              Q.   Is this it?

 6              A.   This is it, yes.

 7              Q.   Can you explain what we're looking

 8    at here?

 9              A.   Okay.  On the left side we see a

10    picture of the earth with a cursor that allows

11    the user to specify the area on the earth that

12    he wants to see.

13                    The source code then takes that

14    information and determines the field of view,

15    that is to say exactly what part of the planet's

16    surface would be covered by a picture of that

17    area.  And that's the field of view.

18              Q.   Okay.  When you were operating

19    Google Earth, were you personally determining

20    the field of view in the way that's laid out in

21    step B?

22              A.   No, I was just telling Google

23    Earth what I wanted to look at.  The software

24    running on the client device is the one that
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 1        actually determines the field of view.

 2                Q.   Have you downloaded Google Earth

 3        to a smart phone?

 4                A.   Yes, I have it on this one here.

 5                Q.   And when you did that, did that --

 6        does that copy of Google Earth belong to you or

 7        does it belong to Google?

 8                A.   That software belongs to Google,

 9        it's very clear.

10                Q.   I would like to take you to tab 3

11        where we placed a copy of Plaintiff's Trial

12        Exhibit 176.  Are you there?

13                A.   I have it.

14                Q.   What is this?

15                A.   This is a copy of the terms of

16        service agreement for Google Maps and Google

17        Earth.

18                Q.   Do you see a paragraph bold faced

19        labeled restrictions on use?

20                A.   I do.

21                Q.   What is the restrictions on use

22        stated in part B under that heading?

23                A.   That section of the agreement

24        makes it clear that unless you have written
```

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1   permission otherwise, you must not copy,

2   translate, modify, or make derivative works of

3   the content or any part thereof.

4   Q.   Let's go back to sort of a general

5   step B. Did you hear Mr. Parker refer to

6   frustums, at least as depicted by Mr. Silman?

7   A.   Yes, I did.

8   Q.   Did you have a graphic to

9   illustrate how frustums are used in a digital

10   image processing?

11   A.   Yes, I have one.

12   Q.   Is this it? Is this the one?

13   A.   This is it.

14   Q.   Can you talk us through what we're

15   looking at here?

16   A.   Okay. Here we have a depiction of

17   a camera floating above the surface of the earth

18   looking down. And the object of the game here

19   is to determine exactly what part of the earth

20   is that camera going to be able to see.

21   So the way that's done in the

22   patent is that a pyramid, an imaginary pyramid

23   extends out from the camera lens until it

24   intersects the earth. And the sides of that

1   pyramid represent the top and bottom and left

2   and right edges of the display screen.

3   So wherever that pyramid

4   intersects the earth, anything inside that

5   four-sided figure, we call that the footprint of

6   the camera, at least in the space program we

7   called that the footprint, anything that falls

8   inside there is visible to the camera and,

9   therefore, it needs to be put on the screen for

10   the user to see. Areas of the earth that fall

11   outside that pyramid which we call the frustum

12   then are not visible to the camera, do not need

13   to be shown to the user, and so that data at

14   least for present purposes can be ignored.

15   Q.   Is that camera used to set the

16   difference between the observer and the object

17   you're interested in looking at?

18   A.   Yes, the location of the camera in

19   space is specified by among other things a

20   distance from the observer, which is a distance

21   where the camera is located to the earth, and

22   the particular angle that the camera is turned

23   to looking at the earth.

24   Q.   Is it a single angle or are there

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 1        multiple angles involved?

 2                 A.   Actually it takes three angles to

 3        specify the direction that the camera is looking

 4        in space.  Airplane pilots call these three

 5        angles the pitch, roll and yaw.

 6                 Q.   Now, in the Google products that

 7        you have considered reading the source code, is

 8        the camera position defined in terms of

 9        quadrants?

10                 A.   Yes, it is.

11                 Q.   What that happens, is there a

12        relationship between the distance of the camera

13        and its Z port?

14                 A.   Yes.  The Google software uses a

15        three dimensional coordinate system that's

16        centered on the camera.  And the Z access points

17        directly out of the center of the lens right

18        down the middle of the frustum of that pyramid

19        we have been talking about.  So the Z coordinate

20        of the camera is, in fact, the distance of the

21        camera above the surface of the earth.

22                 Q.   The three steps that you have laid

23        out on the slide, are those the steps that are

24        used to build a field of view using this virtual
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 1        camera and the frustum?

 2               A.   Yes, they are.

 3               Q.   Can you talk us through those

 4        three steps?

 5               A.   Okay.  The first step is to update

 6        the camera view.  In other words, the user is

 7        going to be moving this camera around as he

 8        looks to see different parts of the planet.  So

 9        the first thing you have to do is get the latest

10        position and pointing angle of the camera.

11        That's the update step.

12                    And then the program builds the

13        frustum, that is it creates this imaginary

14        pyramid that extends out from the lens and

15        determines where that pyramid intersects the

16        earth.

17                    And then the third step is to

18        cull.  I think we have heard other witnesses

19        talk about culling.  That's the process

20        basically of eliminating the things that you

21        don't need.  And it's very important in the

22        process described by this patent that only the

23        data that's needed is downloaded.

24                    So this culling process using the
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 1        frustum determines what parts of the planet are

 2        visible to the camera and everything else is

 3        not.

 4                Q.   And once we have carried out these

 5        three steps, do we arrive at a field of view?

 6                A.   Yes.  You see in this picture, we

 7        have a field of view.  This particular one

 8        includes Europe and North Africa.

 9                Q.   Before we dive into Google source

10        code, I would like to discuss nodes and trees.

11        And do you have a graphic that allows us to have

12        that conversation?

13                A.   Yes, I do.

14                Q.   Could you please explain?

15                A.   Okay.  As I mentioned, the amount

16        of data required to render the entire earth at

17        high resolution is huge and there needs to be a

18        good way to organize that data so that it can be

19        -- so that the data that's needed can be

20        requested and only the data that's needed.  The

21        technique that's used in the patent is a tree

22        structure, it's a data structure.  It's nothing

23        more than a way of organizing the data and

24        keeping track of where the different images are
```

```
 1        located.

 2                   If you can imagine an upsidedown

 3        tree where the branches stick downward and each

 4        branch will split off into other branches, the

 5        places where the splits take place are the

 6        nodes.  So this tree is made up of nodes which

 7        are connected by branches.

 8                   And in the case of this process in

 9        the patent, each node contains one image of the

10        surface of the earth.  So those images that --

11        those thousands of images that are required are

12        organized in this way, in this tree fashion so

13        that in order to find a particular image you

14        just have to go to the proper node on this tree.

15             Q.   Now, going back to step B, have

16        you examined source code for each of the three

17        groups of products to determine whether Google

18        practices this step of the method?

19             A.   Yes, I have done that.

20             Q.   And I would like to start with the

21        group three source code and to begin that

22        discussion.  Could you turn to tab 4 where you

23        placed a copy of Plaintiff's Demonstrative

24        Exhibit 1001.
```

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```
 1              A.   Okay.

 2              Q.   What is this exhibit?

 3              A.   This is an excerpt from

 4    Plaintiff's Exhibit 391 which is a source code

 5    file that has the name Navigator.JS.

 6              Q.   What have you highlighted from

 7    this file?

 8              A.   I have highlighted some of the

 9    comments that explain what this section of the

10    source code does.  In particular at the top, it

11    says this particular file contains an object to

12    help navigate the globe.  Navigator translates

13    user interaction into globe camera state.  So

14    that tells us that this is the routine at a high

15    level that takes the data from the user about

16    what he wants to look at, and creates what's

17    called the camera statement which is basically

18    the position and the pointing angle of that

19    imaginary camera that's floating in space above

20    the earth.

21              MR. WILLIAMSON:  Your Honor, the

22    parties have an agreement about displaying the

23    documents on the screen.

24              MR. SNYDER:  Make sure that the
```

```
 1        jurors can see the small screen.  Is it visible?

 2        And we're going to keep this throughout the rest

 3        of this examination because we will be dealing

 4        with Google confidential documents.  Not all of

 5        them will be source code and I think instead of

 6        juggling around we should do things as well.

 7                    THE COURT:  Well, if they're

 8        documents that aren't confidential, they should

 9        be shown on the screen.  If they are

10        confidential, they should be handled the way

11        you're doing it.

12                    MR. SPEARS:  Okay.  We'll proceed.

13     BY MR. SPEARS:

14             Q.   We've talked about this comment

15        about navigator translating the user interaction

16        into globe camera states.  What else have you

17        highlighted from this exhibit?

18             A.   There's a routine called

19        globe.view and a comment that says a navigator

20        object is linked with a view.  Camera operations

21        performed on the navigator are immediately

22        visible on view and vice versa.  So this

23        establishes the connection between the navigator

24        object, which takes input from the user and the
```

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1   object called globe.view, which keeps track of

2   where the camera is at any point in time. So

3   this is the connection between the user's input

4   and the software's understanding of where that

5   cameras is located.

6   Q.   Have you highlighted anything else

7   from this exhibit?

8   A.   Highlighted the navigator function

9   itself and the comment that says the view is

10   linked to this navigator, and then one

11   executable statement that says this view equals

12   the results returned by routine called get view.

13   So that just confirms that it happened.

14   Q.   Let's turn to Tab 5 where we

15   replaced the Plaintiff's demonstrative Exhibit

16   1002?

17   A.   Okay.

18   Q.   What is this?

19   A.   This is an excerpt from

20   Plaintiff's Exhibit 392 which is a source code

21   file named view.JS.

22   Q.   What have you highlighted from

23   this file?

24   A.   At the top I highlighted the

517

```
 1        comment that says the internal model of views,

 2        camera pose and a comment that says a view

 3        object contains camera pose state and then the

 4        routine globe.view so this makes it clear that

 5        this is a software that keeps track of where the

 6        camera is located and which direction it's

 7        pointing.

 8                   Q.   Can you go to Tab 6 where we

 9        placed a copy of Plaintiff's demonstrative

10        Exhibit 1003?

11                   A.   Okay.

12                   Q.   What is this?

13                   A.   This is an excerpt from

14        Plaintiff's Exhibit 390, which is a source code

15        file named LOD.JS.  And I should say that LOD

16        stands for level of detail.

17                   Q.   What have you highlighted from

18        this file?

19                   A.   I've highlighted a routine called

20        update, one called build visible tree and some

21        comments that tell what these routines do.

22                   Q.   Could you talk us through those

23        comments?

24                   A.   Okay.  Up near the top, it says
```

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1   perform frustum intersection test. So this is

2   what I was speaking about earlier, have to

3   determine which of those nodes on the tree

4   contain images that are in, fall inside that

5   footprint of the camera mainly inside the

6   frustum.

7   Q.   Is that where we're determining

8   the data for the field of view?

9   A.   Yes, it would be.

10   Q.   And is that data determined using

11   a distance in angle information received from

12   the virtual camera?

13   A.   Yes, it is.

14   Q.   What other comments have you

15   highlighted?

16   A.   There's a comment that says builds

17   the visible tree based on the current camera

18   view. The visible tree, as I mentioned, the

19   entire data, excuse me, for the earth is

20   organized in one huge tree. The visible tree is

21   just that branch or those branches of the tree

22   that contain images that the camera can actually

23   see. So building the visible tree means going

24   through the big tree, excuse me, and isolating

1   those branches of the tree that contain the data

2   that needs to be shown to the user.

3   Q.   Are there any other comments we

4   should address on this page of the exhibit?

5   A.   Yes.   There's another routine

6   called build visible tree visit node.   The

7   comments tell us that that is the routine that

8   performs the bulk of the work for building the

9   visible tree.   And it's called for each node on

10   the tree and it determines whether or not to add

11   the node to the visible tree and if so, to fetch

12   that node from the network, which means to get

13   the image down from the servers on the network.

14   Q.   Could we turn to the second page

15   of the exhibit?

16   A.   Yes.

17   Q.   And what have you highlighted

18   here?

19   A.   There is a routine called frustum

20   box intersector is outside.   And that's a

21   routine, according to the comment, check if the

22   child is in the view frustum.   I should explain

23   that on that tree every node has four nodes

24   below it.   The node itself is considered to be

1   the parent and the four nodes below it are

2   considered to be the child. So as we work our

3   way down the tree, we go from each parent node

4   to its children and from each of those to its

5   children. So what this routine is doing is

6   check to see if the child is in the view

7   frustum, which means it's visible to the camera

8   and we need to fetch the data so we can show it

9   to the user.

10   Q.   So in the source code excerpts at

11   Tabs 4, 5 and 6, have you identified what in the

12   Group III product software carries out Step B of

13   Claim 1?

14   A.   Yes, I have. It's this routine

15   navigator, globe.view, update and build visible

16   tree. And one more, frustum box intersector is

17   outside.

18   Q.   Moving on to the graphic. Does

19   this graphic summarize or accurately capture

20   your opinion as to what in the -- I'm sorry,

21   I've slipped ahead. The graphic that we're

22   seeing now, does this accurately summarize your

23   opinion as to what in the Group III software

24   practices Step B of Claim 1?

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```
1                    A.   Yes, at a high level these are the

2          routines that implement the steps, implement

3          Step B of Claim 1.

4                    MS. WILLIAMSON:  Your Honor, can

5          we display the public files that are not source

6          code?

7                    THE COURT:  That doesn't seem to

8          be confidential.  That could be displayed.

9                    MR. SPEARS:  Okay.  All right.

10   BY MR. SPEARS:

11                   Q.   Now, I'd like to --

12                   THE COURT:  We don't have the

13         display.

14                   MR. SPEARS:  Okay.  There we go.

15   BY MR. SPEARS:

16                   Q.   Now, I would like to move from the

17         Group III source code to the Group I source

18         code, so at this point we're going to have to

19         get confidential again.  And to start that

20         process, I'd like to turn to Tab 7 in your

21         notebook.

22                   A.   Okay.

23                   Q.   Where we placed a copy of

24         Plaintiff's demonstrative Exhibit 1004.  What is
```

```
1        this exhibit?

2                 A.   This is an excerpt from

3        Plaintiff's Exhibit 409, which is the source

4        code file named camera.h.  Also on this page is

5        an excerpt from Plaintiff's Exhibit 410, which

6        is the source code file named camera.cc.

7                 Q.   And what have you highlighted from

8        the first file?

9                 A.   There's a comment that says,

10       excuse me, the camera class is the renderer's

11       representation of the camera state.  In other

12       words, this is telling us that this is the

13       software that keeps track of the location and

14       pointing angle of the camera.

15                Q.   And would that location and

16       pointing angle be the distance and angle between

17       the observer and the object?

18                A.   Yes, it would.

19                Q.   What have you highlighted from the

20       second routine that's included -- I'm sorry,

21       from the second file that's included on this

22       exhibit?

23                A.   This is a routine that uses

24       GetWorldFrustum.  And what it does is return a
```

```
 1        frustum for the current view.  And that is

 2        recomputed every time the view changes.  So what

 3        this tells us is this is a software that when

 4        the user moves the viewpoint it creates a new

 5        frustum.

 6              Q.   Could we turn to Tab 8 where we

 7        placed a copy of Plaintiff's demonstrative

 8        Exhibit 1005?

 9              A.   Okay.

10              Q.   What is this?

11              A.   This is an excerpt from the

12        Plaintiff's exhibit #413 and this is a source

13        code file named Mirthmode.CC.

14              Q.   What have you highlighted from

15        this file?

16              A.   There's a routine here called

17        Update and its purpose is to update the view for

18        this frame.  In other words, it updates the data

19        about the camera's position.

20              Q.   What's a frame?

21              A.   Okay.  If you look at a movie

22        basically you get the impression of motion

23        because a number of still images are presented

24        in rapid succession.  Each of those still images
```

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```
 1        is a frame.  So a frame is like one still image

 2        out of a movie.  And if we, if we project those

 3        rapidly in order, then it gives the appearance

 4        of motion on the screen.

 5                Q.   Could we turn to Tab 9 where we

 6        placed a copy of Plaintiffs demonstrative

 7        Exhibit 1006?

 8                A.   Okay.

 9                Q.   What is this?

10                A.   This is an excerpt from

11        Plaintiff's Exhibit 414, which is a source code

12        file named rockmetrix.CC.

13                Q.   What have you highlighted from

14        this file?

15                A.    Highlighted a comment that, that

16        this uses something called GetWorldFrustum and a

17        routine called ContinueTraversal and one called

18        PassCull.

19                Q.   And what do those functions do?

20                A.    The comments tell us that pass

21        cull checks to see if a node fails the culling

22        test.  And the other comments tell us that there

23        are three conditions here, if the node is known

24        to be completely inside the frustum, that means
```

1   it has to be included. Also, there may be

2   images on the back side of the globe that would

3   not be visible, so those are eliminated in this

4   routine.

5   And then finally it checks to

6   identify those images contained in nodes where

7   the images fall inside the oriented box which in

8   this case means the field of view marked off on

9   the surface of the planet.

10   Q.   Sir, are we looking at the source

11   code that determines fields of view in the group

12   one product?

13   A.   Yes, we are.

14   Q.   Does it do that with distance and

15   angle information provided by the virtual

16   camera?

17   A.   Yes, it does.

18   Q.   Can you turn to me tab ten --

19   THE COURT: Excuse me, at some

20   point soon we need to take a break.

21   MR. SPEARS: We have one more

22   demonstrative and we're done with group 1, Your

23   Honor.

24   THE COURT: Okay.

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```
 1                    MR. SPEARS:  Okay.

 2    BY MR. SPEARS:

 3            Q.   At Tab 10, we placed a copy of

 4    Plaintiff's Demonstrative Exhibit 1007.  What is

 5    this?

 6            A.   This is an excerpt from

 7    Plaintiff's Exhibit 416, which is a source code

 8    file named tree traverser.CC.

 9            Q.   What have you highlighted from

10    this file?

11            A.   Okay.  A routine called traverse,

12    and it comments that says performed recursive

13    traversal started at the current node.

14                 I should probably add that

15    traversal is the process of moving down the tree

16    from node to node and making the decision which

17    nodes have images that fall within the field of

18    view and need to be retrieved from the server,

19    that's what traversal is, and that's what this

20    routine does.

21            Q.   The source code behind tab 7

22    through 10, does that -- have you identified

23    what in that source code carries out for the

24    group 1 products step B of claim 1?
```

```
 1                    A.   Yes.   That is these routines get

 2         frustum, update that I mentioned, also continue

 3         traversal pass cull, and this one called

 4         traversal recursive.

 5                    Q.   And we're waiting for our

 6         projector to warm up and we'll have one more

 7         question and then that's it.

 8                    MR. SPEARS:   I think -- can we

 9         proceed without the screen?

10                    THE COURT:   Yes.

11    BY MR. SPEARS:

12                    Q.   And here in this slide, have we

13         accurately identified your analysis of what in

14         the group 1 source code?

15                    A.   Yes, this is the list of the high

16         level routines that take care of implementing

17         step B of the claim for this group.

18                    MR. SPEARS:   This would be a good

19         time to break.

20                    THE COURT:   Thank you.  We'll take

21         a fifteen minute break and come back at 11:15.

22         And just remind the jury not to discuss the case

23         with each other or anybody else.  You're on

24         break.
```

```
 1                    (Jury leaving the courtroom at

 2      10:56 a.m.)

 3                    THE COURT:  Be seated.  Is there

 4      anything else we need to discuss?

 5                    MR. SPEARS:  Just a minor concern

 6      with regard to how we're doing this.  If we

 7      continue waiting for the projector to warm up,

 8      it's going to add maybe a half hour -- maybe not

 9      that much, but more like fifteen minutes to the

10      direct examination.

11                    THE COURT:  My clerk suggest just

12      physically blocking the light when it's a

13      confidential exhibit and then you don't have to

14      have it warmed up.

15                    THE CLERK:  Put a paper in front

16      of it.

17                    MR. SPEARS:  We'll try that, Your

18      Honor.

19                    THE COURT:  Okay.  Anything else?

20                    MR. PARTRIDGE:  Nothing.

21                    THE COURT:  We'll be recess until

22      11:15.

23                    (A brief recess was taken.)

24                    THE COURT:  Please be seated.  The
```

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1   witness may resume his chair. Unless anyone has

2   anything else to raise, we'll bring the jury

3   back in.

4   MR. SPEARS: Nothing for us.

5   (Jury entering the courtroom at

6   11:16 a.m.)

7   THE COURT: Be seated, please.

8   BY MR. SPEARS:

9   Q.   Dr. Castleman, I would like to

10   move from the group 1 products to the group 2

11   products. And to do that, I would like for you

12   to place tab 11 in front of you where we placed

13   a copy of Plaintiff's Demonstrative Exhibit

14   1008.

15   A.   Okay.

16   Q.   What is this exhibit?

17   A.   This is an excerpt from

18   Plaintiff's Exhibit 369 which is a source code

19   file named navigation core.HH. There is another

20   one on the page here, an excerpt from

21   Plaintiff's Exhibit 368 which is a field called

22   navigation core.CC.

23   Q.   What have you highlighted from the

24   first file?

1   A.   The comment at the top says --

2   first off it includes a routine called Frustum.H

3   which keeps track of the frustum. The comment

4   says the position and orientation of the eye in

5   space. In this group of products, the software

6   talks about not a camera, but an eye in space,

7   the observer's eye, but the principle is the

8   same.

9   Q.   What else have you highlighted?

10   A.   A routine called update LOD cull

11   and a comment that says this will typically be

12   called just before calling cull in the database.

13   Q.   Can we turn to Tab 12 where we

14   placed a copy of Plaintiff's Demonstrative

15   Exhibit 1009. Could you tell us what this is?

16   A.   This is an excerpt from

17   Plaintiff's Exhibit 367 which is a source code

18   filed called quad node.CC.

19   Q.   What have you highlighted from

20   this file?

21   A.   A routine called quad node cull

22   and a comment that says it keeps track of the

23   number of nodes that have been visited, and

24   another comment says it computes the child's

```
 1        interaction with the view.

 2                   And also down at the bottom it

 3        says recursive on child.  This is the routine

 4        that examines each of the four children of the

 5        current node to see which ones intersect the

 6        frustum and, therefore, contain an image that is

 7        visible to the camera, or in this case the eye,

 8        and will need to be retrieved from the network

 9        and shown to the user.

10             Q.   I am sorry, Dr. Castleman.  Did

11        you mean to say that this routine computes the

12        child's intersection with the view?

13             A.   I'm sorry, can you give me that

14        again.

15             Q.   That routine computes the child's

16        intersection with the view?

17             A.   That's what I was intending to

18        say.

19             Q.   Is what we're looking at here the

20        stuff in the group 2 source code that determines

21        a field of view?

22             A.   Yes.

23                  MR. WILLIAMSON:  Objection.

24        Leading, Your Honor.
```

```
 1                    THE COURT:  Overruled.

 2       BY MR. SPEARS:

 3               Q.   And does it use information from

 4       the eye or camera in order to do that?

 5               A.   Yes, it does.

 6               Q.   And what sort of information is it

 7       using?

 8               A.   It uses the camera's location and

 9       pointing angle.

10               Q.   Could you turn with me to tab 13

11       where we have placed a copy of Plaintiff's

12       Demonstrative Exhibit 10.

13               A.   I have it.

14               Q.   Could you tell us what this is?

15               A.   This is an excerpt from

16       Plaintiff's Exhibit 372 which is a source code

17       file named visual context.CC.

18               Q.   And what have you highlighted from

19       this file?

20               A.   I have highlighted a comment that

21       says -- tell us what this does, prepares all,

22       renders or managers for rendering a new frame.

23       And the renders and managers are other routines

24       in the software that take care of putting an
```

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```
 1        image on the screen.  So this is the one that

 2        prepares those every time we go to a new frame

 3        in the sequence.

 4                  Q.   What else have you highlighted?

 5                  A.   A routine called update, which

 6        according to the comment here, updates

 7        navigation core for culling traversal.  Remember

 8        we spoke about that, culling traversal means

 9        moving down the tree and determining which of

10        those nodes contain an image that falls inside

11        the field of view, therefore, needs to be

12        requested from the network and shown to the

13        user.

14                  Q.   Is there anything else you have

15        highlighted?

16                  A.   Yes.  Routine culled update all

17        and cull all.

18                  Q.   What do those do?

19                  A.   These are the ones that actually

20        go out and update all the other places in the

21        software where this new information for the new

22        frame is needed.  And cull all is the one that

23        goes out and causes the culling to take place on

24        the four children of the current node.
```

534

```
 1                    Q.   Have you identified in the source

 2       code summarized at tabs 11 through 13 what in

 3       the group 2 source code carries out step B of

 4       claim 1?

 5                    A.   Yes, I have.

 6                    Q.   And does this graphic accurately

 7       capture your analysis of how that step is

 8       carried out in the group 2 source code?

 9                    A.   Yes, update LOD cull, quad node

10       cull, update, update all, and cull all, they --

11       at a high level these are the ones that

12       implement step B.

13                    Q.   Let's move to our check box.  For

14       each of these three group of Google products,

15       are they doing the same thing that's defined by

16       step B in claim 1?

17                    A.   Yes, they are.

18                    Q.   We can go ahead and check those

19       off then?

20                    A.   We can.

21                    Q.   After a field of view is

22       determined according to step B, what happens

23       next?

24                    A.   Once we know which images are
```

```
 1        included in the field of view, we have to get

 2        those down from the server.  And that's Step C,

 3        requesting data for the field of view from at

 4        least one of the data sources.

 5                   Q.   And do you have a graphic to

 6        illustrate how that's done?

 7                   A.   Yes, I do.

 8                   Q.   Could you please explain?

 9                   A.   Okay.  This shows a cell phone

10        located somewhere in Delaware that is sending

11        out a request which goes to a data server

12        located it looks like in Iowa requesting a

13        particular image of the earth that it's going to

14        need to show to the user.

15                   Q.   Now, when you were operating

16        Google Earth, were you personally requesting

17        data through the field of view?

18                   A.   No, I didn't have to do that.  I

19        just told Google Earth where I wanted to see and

20        it decided what request to send out to the

21        network.

22                   Q.   And have you examined Google

23        software to determine where it's done in that

24        code?
```

```
 1              A.   Yes, I have.

 2              Q.   And when you were doing that, what

 3       sort of words were you looking for?

 4              A.   I was looking for words like fetch

 5       and request and load.

 6              Q.   Let's turn to the Group III source

 7       code first, and I'd like for you to turn to Tab

 8       14 where we placed a copy of Plaintiff's

 9       demonstrative Exhibit 1011.

10              A.   Okay.

11              Q.   Okay.  What is this demonstrative?

12              A.   This is an excerpt from

13       Plaintiff's Exhibit 395, which is a source code

14       file named renderablenodemanager.js.

15              Q.   And what have you highlighted from

16       this file?

17              A.   Okay.  There's a comment here that

18       says renderable note manager encapsulates the

19       management of renderable nodes.  That tells us

20       that this is a software that keeps track of

21       which of those nodes contained an image that is

22       renderable.  That means needs to be shown to the

23       user.

24              Q.   What else have you highlighted?
```

```
 1                    A.   A routine call request node, which

 2         requests a renderable node from the server.

 3         That's one.

 4                    Q.   And is the server going to be a

 5         server at one of Google's data centers?

 6                    A.   Yes, it's requested over the

 7         internet, yes.

 8                    Q.   What else have you highlighted?

 9                    A.   Routine called enqueue request,

10         which requests nodes, actually enqueue requests

11         a request node, which requests nodes that have

12         been queued up with enqueue requests.  Basically

13         the queue is a list of the nodes that the

14         software has determined contain the images it's

15         going to need.  So when it says enqueue request,

16         it means put that node on the list.  And when it

17         says request node, it says send out the request

18         to get that picture.

19                    Q.   So do these nodes contain the data

20         for the field of view?

21                    A.   Yes, they do.

22                    Q.   Could you turn with me to Tab 15

23         where we've placed a copy of Plaintiff's

24         demonstrative Exhibit 1032.
```

538

```
 1                A.   Okay.

 2                Q.   What is this?

 3                A.   This is an excerpt from

 4      Plaintiff's Exhibit 390, which is a source code

 5      file named LODmanager.js.  And I should say LOD

 6      stands for level of detail.

 7                Q.   And what have you highlighted from

 8      this file?

 9                A.   I've highlighted a routine called

10      build visible tree, which is the one that

11      determined which branches of the tree contain

12      the nodes that contain the images that the user

13      is able to see.

14                Q.   What else have you highlighted

15      from this file?

16                A.   A routine called build visible

17      tree visit node, which is a lower level routine

18      that basically as it says here performs the bulk

19      of the work for building the visible tree and

20      it's called on each node and it's called in the

21      order of image quality first, so it's calling

22      for higher and higher image qualities.

23                Q.   Have we seen some of this code in

24      connection with Step B?
```

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1   A.   Yes, I have.

2   Q.   Why have you highlighted enqueue

3   request?

4   A.   Enqueue request again is the

5   routine that puts the request on the list, a

6   request to be sent out over the internet to get

7   the pictures.

8   Q.   At Tabs 14 and 15, have you

9   identified what in the Group III source code

10   carries out Step C of Claim 1?

11   A.   Yes, that is enqueue request and

12   request node.

13   Q.   And we're going to move forward to

14   the graphic. And does this graphic -- I'm

15   sorry. Does this graphic accurately capture

16   what you've identified in the source code that

17   carries out Step C for the Group III products?

18   A.   Yes, these are the routines that

19   do that.

20   Q.   I'd like to move forward to the

21   Group I products and I'd like to begin with I'd

22   like for you to turn to Tab 16 where we've

23   placed a copy of Plaintiff's demonstrative

24   Exhibit 1012.

540

```
 1              A.   Okay.

 2              Q.   Okay.  What is this demonstrative

 3    exhibit?

 4              A.   This is an excerpt from

 5    Plaintiff's Exhibit 413, which is a source code

 6    file named mirthmode.cc.

 7              Q.   And what have you highlighted from

 8    this file?

 9              A.   Two routines, one named Fetch and

10    one named Load.

11              Q.   Could you turn with me to the next

12    tab where we've placed a copy of Plaintiff's

13    demonstrative Exhibit 1013?

14              A.   Okay.

15              Q.   What is this?

16              A.   This is an excerpt from

17    Plaintiff's Exhibit 407, which is a source code

18    file named cacheentry.h.

19              Q.   What have you you highlighted in

20    this file?

21              A.   This is that routine, Load, which

22    we saw in the previous file and the comment says

23    it's used for fetching data from the network or

24    from the disk cache.
```

1   Q.   Does it fetch data by requesting

2   that data?

3   A.   It does, over the network, yes, it

4   does.

5   Q.   And over the network is it

6   requesting that data from one of Google's data

7   centers?

8   A.   Yes, it does.

9   Q.   And is the data that's being

10   requested data for the field of view?

11   A.   Yes.

12   Q.   At Tab 16 and 17, have you

13   identified what in the Group I software carries

14   out Step C of Claim 1?

15   A.   It's these two routines, Fetch and

16   Load.

17   Q.   Okay. And if we could move

18   forward to our summary graphic here, does this

19   accurately capture what you've identified in the

20   Group I source code as carrying out Step C of

21   Claim 1?

22   A.   Yes, these are the ones.

23   Q.   Now, I'd like to move from Group I

24   to Group II and to do that, let's start by tab

1   18 where we've placed a copy of Plaintiff's

2   demonstrative Exhibit 1014.

3   A.   Okay.

4   Q.   What is this exhibit?

5   A.   This is an excerpt from

6   Plaintiff's Exhibit 375 which is the source code

7   file named netfetcher.cc.

8   Q.   Is the name -- does the name of

9   that file give you a pretty good clue as to what

10   the code in that file does?

11   A.   I'll have to say that the Google

12   programmers have followed good programming

13   practice and given their routines names that are

14   descriptive of what the routine does. That

15   makes it a lot easier on anybody to come back

16   later in trying to understand what the code

17   does. So the fact that this file is named

18   netfetcher is a strong suggestion that this

19   contains the software that fetches data from the

20   network.

21   Q.   And what have you highlighted from

22   this file?

23   A.   I've highlighted a routine called

24   FetchData and one called CreatRequest and one

```
 1        called EnqueueRequest.

 2                  Q.   What do these routines do?

 3                  A.   CreateRequest -- well, FetchData

 4        is the high level routine that actually

 5        implements getting data from the network and it

 6        uses a routine called CreateRequest, which makes

 7        the request in the first place and the routine

 8        EnqueueRequest, which puts the request on the

 9        list of requests to be sent out to the network.

10                  Q.   And the network is going to be,

11        include the data centers provided by Google?

12                  A.   Yes, the Google data centers are

13        on the internet.

14                  Q.   And what is EnqueueRequest do?

15                  A.   Again, please?

16                  Q.   What does EnqueueRequest do?

17                  A.   Yeah.  EnqueueRequest puts this

18        request that was created by CreateRequest, puts

19        it on the list of requests to be sent out to the

20        Google data centers.

21                  Q.   I'd like for you to move ahead to

22        Tab 44 where we've placed a copy of Plaintiff's

23        demonstrative Exhibit 1033.

24                  A.   Okay.
```

```
 1                    Q.   What is this exhibit?

 2                    A.   This is an excerpt from

 3      Plaintiff's exhibit 367, which is a source code

 4      file named quadnode.cc.

 5                    Q.   And what does that file do?

 6                    A.   Basically it applies hammers to

 7      process the quad node.  This is the high level

 8      routine that processes each node on the tree.

 9                    Q.   You've also highlighted process

10      node.  What does that do?

11                    A.   Process node is a routine that

12      recursively visits each child's node on the

13      tree, below the current node and computes the

14      child's intersection with the view; in other

15      words, determines whether that child needs to be

16      included or not and if it does, it causes that

17      image to be requested over the internet.

18                    Q.   And is the image that is

19      requested, information that is requested

20      correspond to the field of view?

21                    A.   Yes, it does.

22                    Q.   Okay.  The code you that you have

23      highlighted at Tabs 18 and Tab 44, is that the

24      code that in the Group II products carries out
```

```
 1        Step C of Claim 1?
 2                 A.   Yes, it is.   At a very high level,
 3        yes, it is.
 4                 Q.   And what specifically have you
 5        identified?
 6                 A.    This routine called FetchData, the
 7        one called CreateRequest, EnqueueRequest and
 8        ProcessNode.
 9                 Q.    And we'll put up another summary
10        graphic -- if we have got this correct.   And
11        does this graphic accurately summarize what you
12        have identified in the Group II source code that
13        was caring out Step C of Claim 1?
14                 A.   Yes, it does.
15                 Q.    Okay.   Let's move on to our check
16        box.   With respect to Groups 1 products, Group
17        II products and Group III products, do all these
18        products do the same thing that's required by
19        Step C in Claim 1?
20                 A.    Yes, they do.
21                 Q.    So we'll go ahead and check those
22        off.   Moving on, after we requested data to the
23        field of view according to step C, what happens
24        next
```

```
 1                    A.   After you request the data, it

 2       comes back from the internet and according to

 3       this step of the claim you have to store it,

 4       store it on the device that the user is actually

 5       looking at.

 6                    Q.   So the claim says essential

 7       centrally storing the data for the field of

 8       view?

 9                    A.   Yes, it does.

10                    Q.   Has this language received a

11       construction by the Court?

12                    A.   Yes.  The Court determined that

13       this phrase means storing requested data for the

14       field of view in memory at the location of the

15       request.  So that means the data is stored on

16       the user's device, whether it's the laptop,

17       desktop or smart phone.

18                    Q.   Do you have a graphic that

19       describes how this is done?

20                    A.   I do.

21                    Q.   Can you walk us through this,

22       please?

23                    A.   Here we see on the left one of the

24       images that in this case would have been
```

1   requested. And that image is returned to the

2   user's device. The source code then causes that

3   image to be stored in memory on the user's

4   device.

5   Q.   In the context of this invention,

6   how important is it that what you're storing on

7   the user's device is data for the field of view?

8   A.   Okay. The whole reason this

9   technique works is because the data that's

10   needed to display these images to the user is

11   readily available to the computer, even a small

12   computer like the one on our smart phone.

13   So it's important to have data for

14   the field of view always handily available in

15   the memory so that the software can create these

16   pictures and put them on the display.

17   And the memory that's used is

18   cache memory which is a temporary storage

19   memory. So part of the memory is designated for

20   storing this temporary data, so it's kept as

21   long as it's needed and then it's flushed out

22   and replaced with new data. This is key to the

23   operation that actually allows this thing to

24   work so quickly and smoothly on a machine that

```
 1     small.
 2               Q.   Would it be accurate to say that
 3     by doing it this way, the data is always ready
 4     to go?
 5               A.   Yes.  The data required to display
 6     the image that the user wants to see is always
 7     right there in the memory of the device.
 8               Q.   Have you reviewed the Google
 9     software to see if it carries out step D of
10     claim 1?
11               A.   Yes, I have.
12               Q.   When you were doing that review,
13     what sort of words were you looking for?
14               A.   Storing and cache and memory,
15     words like that.
16               Q.   We're going to start with some
17     source code and again with group 3 first.  And I
18     would like to take you to tab 20 where we placed
19     a copy of Plaintiff's Demonstrative Exhibit
20     1015.
21               A.   Okay.
22               Q.   And what are we looking at?
23               A.   This is an excerpt from
24     Plaintiff's Exhibit 374, which is a source code
```

```
 1        file name renderable node.JS.

 2                 Q.   What have you highlighted from

 3        this file?

 4                 A.   A comment that says the

 5        corresponding CPU memory representation is kept

 6        in rock tree node.  So this tells us that this

 7        internal data structure or memory area called

 8        rock tree node is the place that the images that

 9        come back from the internet are stored.

10                 Q.   And what's the CPU memory?

11                 A.   I'm sorry, again, please?

12                 Q.   What is the CPU memory?

13                 A.   The CPU, the central processing

14        unit, the main computer, the main processor

15        inside the user's device that is running this

16        software, it has its own memory, that is where

17        these images are stored.

18                 Q.   Can you turn to the next tab where

19        we placed a copy of Plaintiff's Demonstrative

20        Exhibit 1016?

21                 A.   Okay.

22                 Q.   What is this?

23                 A.   This is an excerpt from

24        Plaintiff's Exhibit 396, which is a source code
```

550

```
 1        file named rock tree node.JS.
 2                Q.   What have you highlighted from
 3        this file?
 4                A.   The comment that says this class
 5        represents the CPU memory representation and
 6        then this routine called rock tree node which is
 7        the one that was mentioned on the previous
 8        exhibit.
 9                Q.   And it's the data that is being
10        stored by these routines today for the field of
11        view?
12                A.   Yes, it's among other things image
13        data for the field of view.
14                Q.   At tabs 20 and 21, have you
15        identified what in the group 3 source code
16        carries out step D of claim 1?
17                A.   Yes, at a very high level the
18        routine rock tree node takes care of that.
19                Q.   So in this graphic, have we
20        actually captured your analysis of what in group
21        3 source code carries out step D of claim 1?
22                A.   Yes.
23                Q.   We're going to move from the group
24        3 products to the group 1 products and to do
```

```
 1        that we'll start with tab 22 where we placed a

 2        copy of Plaintiff's Demonstrative Exhibit 1017.

 3                A.    Okay.

 4                Q.    What is this, Dr. Castleman?

 5                A.    This is an excerpt from

 6        Plaintiff's Exhibit 407 which is a source code

 7        file named cache entry.H.

 8                Q.    And what have you highlighted from

 9        this file?

10                A.    There is a comment -- first off,

11        there is this routine cache entry.  And the

12        comment says cache entry is the focal point of

13        the cache system, and is responsible for

14        fetching and decoding the data into memory

15        objects and reclaiming that object basically

16        when necessary.

17                      So this is the focal point in the

18        software that takes care of putting images in

19        the cache when they come in from the network and

20        making them available to the rest of the

21        software when they're needed for display.

22                Q.    What does it mean by decoding

23        something into a strong memory in memory object?

24                A.    The data comes in in an encoded
```

```
 1        form, it's either compressed or has other

 2        possibly encrypted, so before it can be

 3        displayed, these images have to be decoded and

 4        that's done by this routine as well.

 5                Q.   Is the data stored by this routine

 6        data by the field of view?

 7                A.   Yes, it is.

 8                Q.   In this exhibit, have you

 9        identified what in the group 1 source code

10        carries out step D of claim 1?

11                A.   It's this routine cache entry.

12                Q.   And moving to our graphic, here

13        have we accurately summarized what you have

14        found in group source code that carries out step

15        D of claim 1?

16                A.   Yes, at a high level this does it.

17                Q.   We're going to move on to group 2

18        now and to do that I direct your attention to

19        tab 24 where we have placed a copy of

20        Plaintiff's Demonstrative Exhibit 1018.

21                A.   Okay.

22                Q.   What are we looking at?

23                A.   This is an excerpt from

24        Plaintiff's Exhibit 371 which is a source code
```

```
 1        file named net loader.CC.

 2                 Q.   What have you highlighted from

 3        this file?

 4                 A.   A routine called create node

 5        reference, and notice of another one, cache

 6        node, and one called finish HTTP request, and a

 7        comments that says obviously if we got here, the

 8        node was loaded from the network.

 9                 Q.   And the network, that would

10        include the data centers provided by Google?

11                 A.   Yes, it would.

12                 Q.   And the node here would be part of

13        the data for the field of view?

14                 A.   That's right.

15                 Q.   So generally what does the code

16        that you have highlighted here do?

17                 A.   This creates the area in memory

18        where the data that comes in from the network is

19        stored.

20                 Q.   Could you turn with me to tab 25

21        where we have placed a copy of Plaintiff's

22        Demonstrative Exhibit 1019.

23                 A.   Okay.

24                 Q.   What is this?
```

```
 1              A.   This is an excerpt from

 2   Plaintiff's Exhibit 370 which is a source code

 3   file named cache.CC.

 4              Q.   What have you highlighted from

 5   this exhibit?

 6              A.   A routine named cache node

 7   populate.

 8              Q.   What does that routine do?

 9              A.   This is the one that actually

10   stores the data in the area of memory that we

11   talked about in the previous exhibit.

12              Q.   At tabs 24 and 25, have you

13   identified what in the group 2 source code

14   carries out step D of claim 1?

15              A.   Yes.  It's this routine create

16   node reference and cache node populate.

17              Q.   So in just a second we'll move on

18   to our summary graphic.  And does this

19   accurately summarize what you have found in the

20   group 2 source code that carries out step D of

21   claim 1?

22              A.   Yes, those are the ones.

23              Q.   At this point we can move forward

24   to our check box.  Is it the case that with
```

1   respect to each of the groups, 1, 2 and 3

2   products, that they do the same thing that's

3   defined in step D of claim 1?

4   A.   Yes, they do.

5   Q.   We'll go ahead and check those

6   off. Once we have stored the data in accordance

7   with step D, what happens next?

8   A.   The next thing we do finally is to

9   create an image for the user to see, represent

10   the data for the field of view in a pictorial

11   representation having one or more sections.

12   Q.   Do you have a graphic that

13   illustrates how that's done?

14   A.   Yes, I do.

15   Q.   Can you explain what we're looking

16   at?

17   A.   Okay. On the left we have four

18   images that have been retrieved from the servers

19   and the source code takes those four images and

20   pinches them together to create an image which

21   is displayed on the screen.

22   Q.   Is there a word for this process

23   that's used in computer graphics?

24   A.   Typically this process is called

```
 1        rendering.
 2                  Q.   What does rendering involve?
 3                  A.   Rendering basically says you take
 4        the image data and the terrain data if it exist
 5        and other data that might pertain to the image,
 6        put it all together and put it on the screen so
 7        the user can see it.
 8                  Q.   Does Google source code interface
 9        directly with this display device?
10                  A.   Actually it does not.
11                  Q.   Why not?
12                  A.   Because the user's device whether
13        it's a laptop, desktop or smart phone comes with
14        generic software which handles the low level
15        functions of displaying an image.  What the
16        Google software does is get the image ready and
17        hand it off to this low level software which
18        then takes care of the bookkeeping required,
19        whatever else is required to actually get the
20        image to show up on the display.
21                  Q.   Is this generic software in any
22        way relevant to step E of claim 1?
23                  A.   No, it's not.
24                  Q.   How do you know that?
```

```
 1                    A.   Because the Court has ruled that

 2        it's not.

 3                    Q.   Have you reviewed the Google

 4        software to determine if it does step E of claim

 5        1?

 6                    A.   Yes, I have.

 7                    Q.   And to begin that process, once

 8        again we'll start with group 3 and we'll start

 9        with tab 27 where we placed a copy of

10        Plaintiff's Demonstrative Exhibit 1020.  What

11        are we looking at here?

12                    A.   This is an excerpt from

13        Plaintiff's Exhibit 394 which is the source code

14        file named renderable node.JS.

15                    Q.   Once again, is the title a pretty

16        good clue of what the file is going to do?

17                    A.   It's a pretty good tip off.

18                    Q.   What have you highlighted from

19        this file?

20                    A.   That at the top, that renderable

21        node class is the software that encapsulates a

22        node together with a GPU resources needed to

23        render it, namely the textures and vertex

24        buffers.  What that means is that this class or
```

1   this group of software puts together the imagery

2   and the terrain data if it's available, and

3   gives the GPU which is the graphics processing

4   unit, that's the thing that's built into the

5   device, everything it needs to put a picture on

6   the screen.

7   Q.   Could we turn to tab 28 where we

8   have placed a copy of Plaintiff's Demonstrative

9   Exhibit 1021.

10   A.   Okay.

11   Q.   What are we looking at here?

12   A.   This is an excerpt from

13   Plaintiff's Exhibit 395 which is a source code

14   file named renderable node manager.JS.

15   Q.   And what have you highlighted from

16   this file?

17   A.   Routine called start mesh upload.

18   Q.   What does that do?

19   A.   That is the one that begins the

20   process of transferring the data to the graphics

21   processing unit so that it can appear on the

22   screen.

23   Q.   Can you turn to tab 29 where we

24   have placed a copy of Plaintiff's Demonstrative

```
 1        Exhibit 1022.

 2                A.   Okay.

 3                Q.   What is this?

 4                A.   This is an excerpt from

 5        Plaintiff's Exhibit 389, which is a source code

 6        file named renderer.JS.

 7                Q.   What have you highlighted from

 8        this file?

 9                A.   A comment that tells us what this

10        thing does, it's rendering the globe which is

11        basically creating pictures of the earth that

12        we're going to show the user.  Interestingly

13        enough one of the authors of this software is

14        Mr. Evan Parker whose testimony we saw this

15        morning.

16                Q.   Was Mr. Parker the gentleman who

17        was ably portrayed by Mr. Silliman?

18                A.   He was portrayed, yes.

19                Q.   What else does this file say?

20                A.   This says rendering the meshes in

21        a given node.  It talks about the array of nodes

22        to render.  A routine called render nodes and

23        one called render imagery.  And then a comment

24        that says iterates through the nodes and then
```

1   renders a single pass. So basically this is the

2   one that is creating the data that the GPU needs

3   in order to put the picture on the screen.

4   Q.   You have highlighted a comment,

5   render the meshes in a given node. Why would

6   you want to do that?

7   A.   This is the first time we have

8   talked about terrain data. When you get down to

9   the bottom of the tree, the nodes contain not

10   only an image, an aerial image of the surface,

11   they also contain a model of the shape of the

12   surface with the hills and the valleys.

13   So in this case it's necessary to

14   combine the aerial image of the earth with this

15   model that shows where the hills and valleys

16   are, and this is the meshes. And the reason

17   it's called meshes is that the surface, the

18   shape of the surface is represented as a bunch

19   of triangles that are hooked together. And

20   given the shape of those triangles it recreates

21   the surface of the earth with hills and valleys

22   and rivers and mountains.

23   Q.   The data that's being rendered by

24   this code, is that data for the field of view?

```
 1              A.   Yes, it is.

 2              Q.   At Tabs 27 through 29, have you

 3    identified in the highlighted source code, what

 4    in the Group III source code carries out Step E

 5    of Claim 1?

 6              A.   Yes.   That is this routine called

 7    RenderableNode, startMeshupload and renderNodes.

 8              Q.   Okay. We'll move on once again to

 9    our summary graphic.  And here have we

10    accurately captured your identification of what

11    in the Group III products carries out Step E of

12    Claim 1?

13              A.   Yes, those are the ones.

14              Q.   As our usual routine we're going

15    to progress from Group III to Group I and I'd

16    like to to go to Tab 30 where we've placed a

17    copy of Plaintiff's demonstrative Exhibit 1023.

18              A.   Okay.

19              Q.   What is this?

20              A.   This is an excerpt from

21    Plaintiff's exhibit 415, which is a source code

22    file named planetframehandler.cc.

23              Q.   And what have you highlighted from

24    this file?
```

1   A.   A routine named Render and

2   comments that tell us what this routine does,

3   namely draw the atmosphere, the clouds, the

4   stars, draw the cloud geometry, draw the planet,

5   rocktree planet, which is just the surface of

6   the earth with the hills and valleys, and then

7   finally to draw specific features on top of the

8   planet, such as roads and signs and icons and

9   other things that get added to the picture.

10   Q.   So is this render function

11   rendering data for the field of view?

12   A.   Yes, it is.

13   Q.   Does it do that by itself?

14   A.   No, it calls it. It calls a large

15   number of other functions that implement

16   different parts of this process.

17   Q.   In Plaintiff's demonstrative

18   Exhibit 1023, have you identified what in the

19   Group I source code carries out the function of

20   Step E of Claim 1?

21   A.   At a very high level, it's this

22   routine Render.

23   Q.   And let's move onto our summary

24   exhibit for Group I. And here have we

```
 1        accurately summarized what you have identified

 2        in the Group I software as carrying out Step E

 3        of Claim 1?

 4                 A.   Yes, this is it.

 5                 Q.   Let's go from Group I to Group II

 6        and we'll start with Tab 31 where we've placed a

 7        copy of Plaintiff's demonstrative Exhibit 1024?

 8                 A.   Okay.

 9                 Q.   What is this exhibit?

10                 A.   This is an excerpt from

11        Plaintiff's Exhibit 377, which is a source code

12        file named visualcontext.cc.

13                 Q.   What have you highlighted from

14        this file?

15                 A.   Two routines, one called Draw and

16        one called Render.

17                 Q.   And what does the Render function

18        do?

19                 A.   The Render function does the same

20        function that we saw in the previous, for the

21        previous objects, it basically gets the image

22        ready to go to the screen.

23                 Q.   Can you turn to Tab 32 where we've

24        placed a copy of Plaintiff's demonstrative
```

1   exhibit 1025?

2   A.   Okay.

3   Q.   What is this?

4   A.   This is an excerpt from

5   Plaintiff's Exhibit 376 which is a routine

6   called visualcontext.cc, which is the same one

7   we were looking at before.

8   Q.   Different code from the same file?

9   It's different code from the same file?

10   A.   That's correct. Different

11   exhibit, different code, same file.

12   Q.   What have you highlighted in

13   Plaintiff's demonstrative exhibit 1025?

14   A.   Again, this routine called Render,

15   along with comments that tell you the things

16   that it does. It draws the star field, it draws

17   the terrain, it draws the clouds and other

18   things. So this is the one where the image is

19   actually put together.

20   Q.   And when it's drawing star fields,

21   drawing terrain, drawing clouds, is it rendering

22   data for the field of view?

23   A.   Yes, it is.

24   Q.   So at Tabs 31 and 32 both of which

```
 1        pertain to this visual context file, have you

 2        identified what in the Group II source code

 3        carries out Step E of Claim 1?

 4                A.   Yes, and again it's the routine

 5        named Render.

 6                Q.   Let's move onto our summary

 7        exhibit.  We'll get this up.  And here of we

 8        accurately summarized what in the Group II

 9        source code you have identified that carries out

10        Step E of Claim 1?

11                A.   Yes, that's correct.

12                Q.   I think that we're ready to go to

13        our check box.  For each of the Groups I, II and

14        III products, are they doing the same thing

15        that's defined by Step E of Claim 1?

16                A.   Yes, they are.

17                Q.   And the data for the field of

18        view, is it going to be represented in a way

19        that it's sectionalized?

20                A.   Yes, it's made up much sections.

21                Q.   And that's true for all three

22        groups of products?

23                A.   Yes.

24                Q.   So we can go ahead and check off
```

566

1   Step E for Groups I II and III then?

2   A.   Yes, we can.

3   Q.   Okay. Now, we spoke -- remember

4   that generic software we spoke about earlier?

5   A.   Yes.

6   Q.   Okay. Does the Google software in

7   any way condition what that generic software

8   does?

9   A.   Yes. That low level software

10   basically only does what it's told. So it takes

11   its orders from the Google software. It runs

12   under the conditions that are specified by the

13   Google software.

14   Q.   And in the same way is the Google

15   software establishing the manner and timing of

16   what that generic software does?

17   A.   Yes, the Google software tells it

18   what to do and when.

19   Q.   And is that true for all of the

20   Google products that you considered?

21   A.   Yes, it is.

22   Q.   Now, we spoke earlier about the

23   concept of a frame. Do you remember that?

24   A.   I'm sorry, again, please.

```
 1                    Q.    We spoke earlier about the concept

 2         of a frame.  Do you remember that?

 3                    A.    Yes, we did.

 4                    Q.    As we've progressed from Steps B

 5         through Step E.  How many frames have we been

 6         dealing with?

 7                    A.    So far we have been talking about

 8         the construction of a single frame.  This would

 9         be -- these steps are required to create one

10         still image in the sequence.

11                    Q.    Does that change when we get to

12         Step F?

13                    A.    Yes, it does.  Step F talks about

14         creating the next frame.

15                    Q.    And how does it do that?

16                    A.    It does that by dividing the

17         sections in the current frame and if their

18         resolution is not as high as is needed, then it

19         requests higher resolution images again from the

20         network for each of the smaller sections that it

21         divides the sections into and represents the

22         data for the field of view in a new pictorial

23         representation.  So this would generate the next

24         frame using higher resolution data that it had
```

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```
 1        gotten back from the servers.

 2                Q.   Is it appropriate to consider Step

 3        F in combination with Step G?

 4                A.   Yes, it would.

 5                Q.   Why is that?

 6                A.   Because Step F is the one that

 7        does the heavy lifting.  And Step G basically

 8        says you repeat that to generate subsequent

 9        frames until you reach a stopping point, so step

10        G mainly says repeat Step F until it's time to

11        stop.

12                Q.   Has step F received a construction

13        by the Court?

14                A.   Yes, it has.

15                Q.   And unfortunately we don't have it

16        up on the slide, but can you recall generally

17        what that was?

18                A.   As I recall, the Court ruled that

19        the requesting step must follow the dividing

20        step, so you divide and then request.

21                Q.   Do you have a graphic that

22        generally described this process?

23                A.   Yes, I do.

24                Q.   Okay.  What are we looking at
```

```
 1      here?

 2               A.   Okay.  On the upper right we see a

 3      small image of Europe and North Africa and if we

 4      take that single image and blow it up to fill

 5      the screen we're going to get a blurry image and

 6      that's what you see on the left side.  So Step F

 7      said let's divide those sections into smaller

 8      sections and request images or request data for

 9      each of the sections then we can put those

10      together to form a high resolution image which

11      will look sharper on the screen in the next

12      frame.  And then to take it one step further,

13      suppose we took the region, the section that

14      shows France and Spain and wanted to see that in

15      more detail, we could take that section, break

16      it up into four smaller sections, request higher

17      resolution images of those four sections, then

18      put them together to get a sharper image of

19      France and Spain.

20               Q.   From time to time we've referred

21      to level of detail.  Can you tell us what that

22      is?

23               A.   Yes.  Level of detail refers to

24      how small of objects you can see in an image.
```

1   If an image has a low level of detail, it will

2   look blurry and you won't be able to see the

3   small frames. If an image has a high level of

4   detail, then it will look sharp and you'll be

5   able to see small things in the image as well as

6   the big things.

7   Q.   You were here for Mr. Mercay's

8   testimony yesterday, correct?

9   A.   Yes.

10   Q.   Did you hear Mr. Mercay talk about

11   level of detail culling?

12   A.   Yes, I did.

13   Q.   What is that mean generally?

14   A.   Basically remember culling is the

15   process of determining which nodes contain an

16   image that you want to show the user. So level

17   of detail culling would be going down the tree,

18   looking at the nodes and finding the ones that

19   contain images with higher detail that we do, in

20   fact, want to use to show on the screen.

21   Q.   Did you review the Google software

22   to determine if it carries out Steps F and G?

23   A.   Yes, I have.

24   Q.   And when you were doing that, what

```
 1        sort of words were you looking for?

 2              A.   Words like let's see, repeat and

 3        nodes and recurse.

 4              Q.   Okay.  At this point I'd like to

 5        dive into the Group III source code.  And to do

 6        that, could you turn to Tab 35 where we've

 7        placed a copy of Plaintiff's demonstrative

 8        exhibit 1026?

 9              A.   Sorry, the number was what?

10              Q.   Tab 35 where we placed a copy of

11        Plaintiffs demonstrative exhibit 1026.

12              A.   Okay.

13              Q.   What is this exhibit?

14              A.   This is an excerpt from

15        Plaintiff's Exhibit 390, which is a routine

16        called Lodmanager.js.

17              Q.   What have you highlighted from

18        this exhibit?

19              A.   At the top a comment that says

20        this software computes the list of nodes that

21        match the required level of detail.  And the

22        routine LodManager, which is the software that

23        does that, and a variable called target image

24        quality, which is what it uses to determine
```

```
 1        whether we've gotten as far as we need to go or

 2        not.

 3                 Q.   So what does LodManager do?

 4                 A.   I'm sorry, again please.

 5                 Q.   What does LodManager do?

 6                 A.   LodManager is the one that manages

 7        the searching down the tree for nodes that

 8        contain high resolution images that we need to

 9        put on the screen.

10                 Q.   And how is target imagery quality

11        used in this process?

12                 A.   I'm sorry, again please.

13                 Q.   House target imagery quality used

14        in this process?

15                 A.   Yeah.  That is the level of detail

16        that we need to get to.  In other words,

17        eventually if you go to higher and higher

18        resolution you'll eventually get to the point

19        where you are displaying a full resolution that

20        the display screen is capable of.  At that point

21        it's not necessary to go any further, so that is

22        the target image quality.

23                 Q.   In the context of Step F, is that

24        the desired image resolution?
```

```
 1                    A.   Yes, that's what this is.

 2                    Q.   And in the context of Step F, is

 3        LodManager the function that is dividing

 4        sections that lack the desired image resolution

 5        into smaller sections?

 6                    A.   Yes, at a high level, this is the

 7        routine that does that.

 8                    Q.   What else have you highlighted

 9        from the this source code?

10                    A.   A comment that says it computes

11        the set of nodes to render given the Lod

12        criteria defined by the target image quality.

13        That's exactly what we've been saying.  It

14        determines which nodes contain high resolution

15        images that we do need to show to the user

16        because they meet the image quality target that

17        has been set here.

18                    Q.   What else have you highlighted?

19                    A.   Again, this routine called

20        TargetImageQuality and a comment that said this

21        is the primary level of detail control and down

22        at the bottom it says that this creates a

23        subtree of the rocktree that has image quality

24        less than or equal to the TargetImageQuality.
```

```
 1        So again, this is telling us that this software

 2   works its way down the tree requesting higher

 3   and higher resolution images until it gets to

 4   the point that the resolution is as high as we

 5   need.

 6              Q.   Let's turn to the second page in

 7   the exhibit.  What have you highlighted here?

 8              A.   Again, the routine called

 9   BuildVisibleTree and a routine that it calls

10   named BuildVisibleTreeVisitNode.

11              Q.   What do these routines do?

12              A.   They build the visible tree, which

13   I think I explained before, is isolating those

14   branches of the tree on the server that contain

15   the images that are visible to the camera and

16   therefore need to go into the image we're going

17   to put on the screen.

18              Q.   What else have you highlighted

19   from this source code?

20              A.   This routine called Recurse and

21   one called isLeave.  And again EnqueueRequest

22   and isLeave basically, isLeave tells you have

23   you made it to the bottom of the tree or have

24   you gone as far as you can go.  One of the
```

```
 1        stopping criteria is you've gone down the tree

 2        as far as you can go and there's no higher

 3        resolution data available.  This is a routine

 4        that checks for that and it's a stopping point.

 5        I've also highlighted EnqueueRequest, we've seen

 6        that one before, that's the one that puts a

 7        request on the list for nodes that were needed

 8        from the network.  And again, this comment says

 9        recurse to the children if we need to.  And

10        there's a test that says do we need to go any

11        further down the tree or have we gone far

12        enough.

13               Q.   In the context of Step G, does

14        recurse determine -- is recurse what determines

15        determination conditions?

16               A.   Yes, it does.

17               Q.   And in the context of step F, is

18        enqueue request, what request higher resolution

19        space related data the smaller sections once a

20        decision has been made?

21               A.   Yes.  We talked about that one

22        before, it puts a request on the list for the

23        new node that we need, for the image -- for the

24        new image that we need.
```

```
 1              Q.   And Plaintiffs's Demonstrative

 2    Exhibit 1026, have you identified what in the

 3    group 3 source code carries out steps F and G of

 4    claim 1?

 5              A.   Yes, routine LOD manager using the

 6    variable target image quality.  Also build

 7    visible tree and with help from build visible

 8    tree visit node.  Routines called recurse and

 9    IsLeaf, and again the one EnqueueRequest.

10              Q.   We're going to move on to our

11    summary graphic at this point.  Here are where

12    we actually captured what you have identified

13    from the group 3 source code as carrying out

14    steps of F and G in claim 1?

15              A.   Yes, these are the ones that do

16    that.

17              Q.   We are go to move from group 3 to

18    group 1.  And to start that process I direct

19    your attention to tab 36 where we placed a copy

20    of Plaintiff's Demonstrative Exhibit 1037?

21              A.   Okay.

22              Q.   What is this exhibit?

23              A.   This is an excerpt from

24    Plaintiff's Exhibit 416 which is a source code
```

577

```
 1        file named tree traverser.CC.

 2                 Q.   And what have you highlighted in

 3        this file?

 4                 A.   Okay.  There is a comment at the

 5        top that says perform recursive traversal

 6        starting at the current node.

 7                 Q.   What does traversal mean?

 8                 A.   Traversal is the process of

 9        working your way down the tree node by node and

10        determining whether or not the image in that

11        node needs to be retrieved from the server and

12        shown to the user.

13                 Q.   What else have you highlighted

14        from this file?

15                 A.   The routine traverse recursive,

16        also a routine name continue traversal and again

17        traverse recursive.

18                 Q.   What is continued traversal and

19        traverse recursive do?

20                 A.   Continued traversal determines

21        whether or not we need to go forward down the

22        tree and traverse recursive is the routine that

23        repeatedly examines one node after the other.

24                 Q.   Do they interface with the fetch
```

1   functions we discussed earlier?

2   A.   Yes, they do. If this software

3   determines that the image for a node is needed,

4   then it uses the fetch software to request and

5   download that image from the network.

6   Q.   In the context of step F, is this

7   software in combination with the fetch software

8   what requests higher resolution space related

9   data once images are divided into smaller

10   sections?

11   A.   Yes, this does that.

12   Q.   Could you turn with me to the next

13   tab where we placed a copy of Plaintiff's

14   Demonstrative Exhibit 1028.

15   A.   Okay.

16   Q.   Could you tell us what this is?

17   A.   This is an excerpt from

18   Plaintiff's Exhibit 414 which is a source code

19   filed named rock metrix.CC.

20   Q.   What have you highlighted from

21   this file?

22   A.   The routine continued traversal

23   and a comment that says check if the node fails

24   LOD, basically or, if it's not visible.

1   Q.   Is that the termination condition

2   that's defined in step G?

3   A.   Yeah, that is the two termination

4   conditions that are defined in step G. If it

5   fails LOD, then that means we can stop looking

6   further. And if it's not visible, then we don't

7   -- then it gets culled and we don't need it.

8   Q.   What else have you highlighted

9   from this file?

10   A.   A routine called pass LOD and it's

11   cull. It says consider the node to have passed

12   the LOD test if it's LOD is above this value LOD

13   threshold.

14   Q.   Is the software that we have

15   identified here in the concept of step F, is

16   this what divides sections that don't need the

17   desired image resolution in the smaller

18   sections?

19   A.   Yes, it is.

20   Q.   What I would like to do is to work

21   backwards a little bit to tab 16 which is

22   something we have already looked at earlier in

23   connection with another step of the claim. And

24   here we placed a copy of Plaintiff's

```
 1        Demonstrative Exhibit 1012.
 2                 A.   Counsel, what is your tab number?
 3                 Q.   It's tab 16, sir.
 4                 A.   Okay.  Got that.
 5                 Q.   Just a reminder, what are we
 6        looking at here?
 7                 A.   Again, this is from Plaintiff's
 8        Exhibit 413, the source code file named murph
 9        mode.CC.
10                 Q.   You have identified that fetch
11        function in here?
12                 A.   Yes, the fetch and the load
13        function.
14                 Q.   Is this the fetch function that
15        you indicated interfaces with continued
16        traversal and traverse recursive in the context
17        of Plaintiff's Demonstrative 1027?
18                 A.   Yes, these are the routines that
19        are used.
20                 Q.   So the source code at tab 16, at
21        tab 36, and at tab 37, have you identified in
22        this source code what in the group 1 products
23        carries out steps F and G of claim 1?
24                 A.   Yes.  This routine continued
```

```
 1        traversal and traverse recursive, also using the

 2        function pass LOD, and then using also fetch and

 3        load.

 4                Q.   We're going to move to our summary

 5        slide.  Here have we accurately summarized what

 6        group 1 source code you have identified as

 7        carrying out step F and G?

 8                A.   Yes, although I don't think we

 9        mentioned pass and LOD.

10                Q.   Let's go to the group 1 products

11        and to begin that, I would like to direct your

12        attention to tab 38 where we placed a copy of

13        Plaintiff's Demonstrative Exhibit 1029?

14                A.   Okay.

15                Q.   What is this exhibit?

16                A.   This is an excerpt from

17        Plaintiff's Exhibit 377 which is a source code

18        file named visual context.CC.

19                Q.   What have you highlighted from

20        this file?

21                A.   I have highlighted routines named

22        draw and update and render, and end frame.

23                Q.   So this is a fairly high level

24        file, then?
```

```
 1                    A.   Yes, they are.  And you can tell

 2         by their names in this case what they do.

 3                    Q.   Could we turn to tab 39 where we

 4         placed a copy of Plaintiff's Demonstrative

 5         Exhibit 1030.  Can you tell us what this is?

 6                    A.   This is an excerpt from

 7         Plaintiff's Exhibit 367 which is a source code

 8         file named quad node.CC.

 9                    Q.   What have you highlighted from

10         this file?

11                    A.   I have highlighted routines named

12         quad node cull, process node, and one called

13         maximum level.

14                    Q.   What is quad node cull do?

15                    A.   This is the one that goes down the

16         tree examining nodes to determine if they need

17         to be -- if their images need to be requested

18         because they contain the higher resolution

19         that's needed to show to the user.

20                    Q.   In the context of step F, is this

21         the function that divides sections that don't

22         meet the desired image resolution into smaller

23         sections?

24                    A.   Yes, that's what it does.
```

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```
 1              Q.   What else have you highlighted in

 2      this exhibit?

 3              A.   It says only recurse on children

 4      if their level is within max level and then it

 5      has a test, a statement, an the statement that

 6      checks to see if child level is less than or

 7      equal to this variable maximum level.

 8              Q.   What does that do?

 9              A.   I'm sorry, again?

10              Q.   What does this maximum level thing

11      do?

12              A.   Maximum level is the specification

13      of how far we need to go in higher resolution,

14      because eventually we get to the point where we

15      don't need any higher resolution to fill the

16      screen.

17              Q.   In the context of step F, is this

18      maximum level the desired image resolution?

19              A.   Yes, that's what it is.

20              Q.   You have also highlighted a

21      process called process node.  What does that do?

22              A.   Process node is the high level

23      routine that examines the node, determines which

24      of the children, if any, need to be requested
```

584

```
 1        from the server and then actually gets them from

 2        the server.

 3                Q.   In the context of step F, is this

 4        process node function what request higher

 5        resolution space related data for smaller

 6        sections once a larger section has been divided?

 7                A.   Yes, this at a high level.  This

 8        is the one that controls that process.

 9                Q.   Could you turn with me to tab 40

10        where we placed a copy of Plaintiff's

11        Demonstrative Exhibit 1031?

12                A.   Okay.

13                Q.   What is this exhibit?

14                A.   This is an excerpt from

15        Plaintiff's Exhibit 398, which is a source code

16        file named rock tree.CC.

17                Q.   What have you highlighted in this

18        file?

19                A.   A routine called cull children and

20        one called passes LOD, along with the comments.

21                Q.   What are these comments testimony

22        us about what cull children is doing?

23                A.   It says there is no need to cull

24        the children if we don't compare LOD matrix,
```

1   that means -- what that means is that there is

2   no need to download the images in those child

3   nodes if they don't meet the level of detail

4   criteria.

5   Q.   And is pass LOD the function that

6   carries out that test?

7   A.   Passes LOD is the one that makes

8   that determination as to whether the child nodes

9   need to be downloaded or not.

10   Q.   In the context of claim 1, is this

11   the function that carries out step G?

12   A.   Yes, it is.

13   Q.   At tabs 39 and 40, have you

14   identified what in the group 2 source code

15   carries out the functions of F and G of claim 1?

16   A.   Yes. That's the routine quad node

17   cull, process node using the variable maximum

18   level, and then this routine cull children, and

19   the routine passes LOD.

20   Q.   I think we can move forward to our

21   summary slide at this point. Here have we

22   identified, accurately summarized what you have

23   identified in the group 2 source code as

24   carrying out steps F and G of claim 1?

```
 1                    A.   Yes, these are the ones.

 2                    Q.   Now, before we check off some

 3       boxes, there is some other language in step F

 4       that we have not talked about.  Do you see about

 5       four lines in where we need to centrally store

 6       the higher resolution space-related data?

 7                    A.   You're talking about step F?

 8                    Q.   Yes, I am, centrally storing the

 9       higher resolution space-related data.

10                    A.   And your question is?

11                    Q.   My question is, is this done in

12       all three of the Google products, all three

13       groups?

14                    A.   Yes, they all do it.

15                    Q.   Likewise for all three of these

16       products, are data of the field of view

17       represented in a pictorial representation?

18                    A.   Yes, they all three do that, too.

19                    Q.   Do all three groups of products do

20       exactly what's in steps F and G?

21                    A.   Yes, as it turns out, they do.

22                    Q.   So we'll go ahead and check those

23       off.

24                    Before moving on, I got a couple
```

1   of little follow-up questions to get. We noted

2   that the very last phrase of step F refers to

3   representing data for the field of view in a

4   pictorial representation. Do you see that?

5   A.   I do.

6   Q.   So is step F in any way concerned

7   with data that's not in the field of view?

8   A.   No, it's not, because the only way

9   you can make this thing work on a smart phone at

10   these speeds is to request no more data than you

11   actually need to show the user, so the whole

12   process here is intended to request just the

13   data that you need and no extra data. And that

14   is always the data that falls inside the field

15   of view, because there is no reason to request

16   images that the user is not going to be able to

17   see.

18   Q.   Another question about step F.

19   You talked about we're dealing with a single

20   frame when we go through steps D and E?

21   A.   That's right.

22   Q.   When we bring that frame into step

23   F, does step F in any way require that what is

24   represented to be the final targeted image at

1   the fine level detail that we're actually

2   targeting?

3   A.   No.   The first time step F is

4   executed, it would create a second frame in the

5   sequence.   In other words, step E would create

6   the first frame.   Step F, the first time through

7   would create the second frame in the sequence.

8   Then when we get down to step G, it says repeat

9   step F.   So step F would then -- would then

10   create frames three and four and five and so on.

11   So it's repeated executions of step F that

12   create the subsequent frames.

13   So basically the first frame comes

14   from step E.   The second frame it comes from

15   step F the first time through, and then G tells

16   us that step F has to be repeated over and over

17   to create all the remaining frames.

18   Q.   So in all of the Google products,

19   is step F completed at least once before step G

20   occurs?

21   A.   Yes, it is.

22   Q.   So we're through claim 1 and the

23   good news is the other claims are going to be a

24   lot shorter to deal with.   The first such claim

```
 1        we're going to move to is claim 3.
 2                    MR. WILLIAMSON:  I would like to
 3        move to strike, Your Honor.  There is no
 4        question.  It's just argument on the slide.
 5   BY MR. SPEARS:
 6                Q.   Now that we have checked off all
 7        the boxes of the claim 1, is it infringed?
 8                A.   Yes, it is.
 9                Q.   All right, then.  Let's move on to
10        claim 3.  Here we have placed claims 2 and 3.
11        Claim 3 says a method of pictorial
12        representation further including altering the
13        selectable location and performing steps B
14        through G.  What does it mean to alter the
15        selectable location?
16                A.   That's when the user moves the
17        viewpoint, decides he wants to look at a
18        different place on the surface of the earth.
19                Q.   Have you heard reference to a
20        precision problem that can arise when you do
21        that?
22                A.   Yes, I think we have heard at
23        least three people testify about the numerical
24        precision problem.
```

590

1   Q.   And in just a couple of sentences

2   can you summarize that problem?

3   A.   Okay. I'll give the fourth

4   explanation of that. All computers have a limit

5   on how big a number they can represent. There

6   is a biggest number that any particular computer

7   can represent. And what happens is that if you

8   are trying to represent the position of an

9   object using a coordinate system with reference

10   to an origin or a reference point that's a long

11   distance away, then you have to use very big

12   numbers.

13   For example, if you want to

14   represent an object in inches and you're using

15   the center of the earth as a reference point,

16   then that's a very large number of inches. So

17   you run the risk of running out of numbers in

18   the computer. But if you can use the reference

19   for your coordinate system up near where the

20   object is located then the numbers become much

21   smaller and you don't run the risk of running

22   out of numbers in the computer.

23   Q.   Now, when Mr. Parker as portrayed

24   by Mr. Silliman testified, did he talk about how

```
1        Google encountered this very problem?

2               A.   I'm sorry, again, please.

3               Q.   When Mr. Parker as portrayed by

4    Mr. Silliman testified, did he talk about how

5    Google itself encountered this problem?

6               A.   I believe he mentioned that, yes.

7               Q.   How does claim 3 solve this

8    problem?

9               A.   The solution that claim 3 offers

10   is basically simply to change the coordinate

11   system, which means move the reference point

12   that you're measuring from to a location that is

13   closer to the object you're looking at.

14              Q.   Has Google adopted the same

15   solution in its products?

16              A.   Yes, they have.

17              Q.   Under what circumstances does

18   Google do these coordinate transformations?

19              A.   According to the testimony we

20   heard, it does it very often.  Certainly when

21   you get down close to the surface where you're

22   looking at objects that are small.  Also when

23   you use the street view option in Google Earth

24   it changes the coordinate system.
```

```
 1                    Q.   Can you turn to tab 41 where we

 2       placed a copy of Plaintiff's Trial Exhibit 140?

 3                    A.   All right.

 4                    Q.   What is this?

 5                    A.   This is a document produced by

 6       Google entitled geo coordinate systems.

 7                    Q.   I would like for you to turn to

 8       the page in that document that ends in 737.

 9       Under the heading local coordinate system in the

10       middle, what does this indicate, if anything,

11       about Google's use of coordinate transmissions?

12                    A.   That paragraph says that local

13       coordinate systems differ from global coordinate

14       systems.

15                    MR. WILLIAMSON:   Take that down.

16                    MR. SPEARS:   Sorry.

17                    MR. WILLIAMSON:   It's cut off.

18       But it's on the written page.

19                    MR. SPEARS:   All right.

20                    Q.   I'll repeat my question.  What, if

21       anything, does this paragraph indicate about

22       Google's use of local coordinate systems?

23                    A.   Yes, it explains that the local

24       coordinate systems define, for example, the
```

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1   objects on a much smaller scale. And require

2   much less precision than global coordinate

3   systems. So in other words you can get by with

4   using much smaller numbers if you're describing

5   these objects using a local coordinate system

6   than if you stay with the global coordinate

7   system that you need when you're looking at the

8   entire planet.

9   Q.   Do you need smaller numbers with

10   the local coordinate system or larger numbers?

11   And how is it that you're able to use smaller

12   numbers in the local coordinate system?

13   A.   Because the objects that you're

14   describing are much closer to the zero zero

15   point of distance, so the distance from the

16   reference point to the object is much smaller.

17   Q.   And to get them closer to the

18   zero, do you have to do a coordinate

19   transformation?

20   A.   Yes a coordinate transformation is

21   the process that takes care of that.

22   Q.   Could you move two pages forward

23   in the document? And under the heading Pano

24   Coordinate, do we see another description of

1   another circumstance in which Google uses

2   coordinate transformations?

3   A.   Yes.

4   Q.   Could you explain that?

5   A.   Yes. It says here that pano

6   coordinates are a local coordinate system used

7   for rendering street view. So when you go into

8   street view on Google Earth, the objects are

9   described in terms of a, their distance from a

10   point that is much closer than the center of the

11   earth. Here we see a coordinate, an X, Y, Z

12   coordinate system that's located very close to

13   this automobile.

14   Q.   Okay. We're going to move

15   forward. So with respect -- and is this true

16   for all three groups of Google products?

17   A.   Yes, it is.

18   Q.   All three use the coordinate

19   transformation defined in Claim 3?

20   A.   They do.

21   Q.   So we can go ahead and check off

22   Claim 3 for each of the three groups of

23   products?

24   A.   Yes, we can.

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```
 1                    Q.   Okay.  So is that claim infringed,

 2      then?

 3                    A.   It is.

 4                    Q.   Let's move on to Claim 14.  And

 5      here we have the method of pictorial

 6      representation defined in Claim 1 wherein the

 7      step now comprises dividing each of the one or

 8      more sections using a model of the quadrant

 9      tree.  Has this phrase been construed by the

10      Court.

11                    A.   Yes, it has.

12                    Q.   What does the Court say?

13                    A.   Determined that that phrase means

14      where the data structure or each node has four

15      equally sized children.

16                    Q.   And does Google use such a data

17      structure in the Group I through III products?

18                    A.   Yes, they do.

19                    Q.   Let's take the Group III products

20      first.  And I'd like to take you to Tab 42 where

21      we've placed a copy of Plaintiff's trial exhibit

22      75?

23                    A.   I'm sorry, which Tab?

24                    Q.   Tab 42?
```

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```
 1              A.    42.  Okay.

 2              Q.    Okay.  Are you there?

 3              A.    Yes.

 4              Q.    What is this document?

 5              A.    This is a set of slides that were

 6      presented by Google personnel at the SIGGRAPH

 7      conference in Vancouver in 2014.

 8              Q.    And did you hear Mr. Parker as

 9      portrayed by Mr. Silliman talk about this

10      presentation?

11              A.    Yes, he did.

12              Q.    Could you turn with me to Slide

13      15?  And what, if anything, does this slide

14      indicate about Google's use of quadtrees in the

15      Group I products?

16              A.    Okay.  We see the first bullet

17      point.

18              Q.    I'm sorry, in the Group III

19      products.

20              A.    The first bullet point talks about

21      a radial octree which includes a 2D quadtree in

22      latitude and longitude.

23              Q.    And is this consistent with what

24      you found in the Group III source code?
```

```
 1              A.   Yes, it is.

 2              Q.   Moving from Group III to Group I,

 3     were you hear for Mr. Mercay's testimony?

 4              A.   Yes, I was.

 5              Q.   And did you hear Mr. Mercay say

 6     anything about the use of quadtrees in the Group

 7     I products?

 8              A.   He said that the software

 9     definitely uses quadtrees.

10              Q.   Let's move onto the Group II

11     products and to do that have you turn to Tab 43

12     where we've placed a copy of Plaintiff's trial

13     exhibit 27.

14              A.   Okay.

15              Q.   And we're going to have to get

16     confidential on this.  What is this exhibit?

17              A.   This is a document produced by

18     Google which is entitled Terrain Overlays.

19              Q.   And could you turn to the page in

20     that document that ends in A16.  Are you there?

21              A.   Okay.

22              Q.   Under the heading how visible

23     terrain meshes get collected.  Do you see a

24     reference to Figure 1?
```

```
 1                     A.   Yes, I do.

 2                     Q.   And if we turn to the next page,

 3          is that Figure 1?

 4                     A.   Yes, it is.

 5                     Q.   And what, if anything, does Figure

 6          1 indicates about the use of quadtrees in the

 7          Group II products?

 8                     A.   We see two quadtrees.  We see two

 9          parent nodes each of which has four child nodes.

10                     Q.   And is this consistent with what

11          you saw in the Group II source code?

12                     A.   Yes, it is.

13                     Q.   So moving onto our check box now

14          that we're no longer confidential, the Group I,

15          Group II, Group III products, do they all use

16          division according to a model of the quadrant

17          tree?

18                     A.   Yes, they do.

19                     Q.   So we'll go ahead and check those

20          off?

21                     A.   Yes.

22                     Q.   And is Claim 14 infringed?

23                     A.   Yes, it is.

24                     Q.   Let's move on from Claim 14 to our
```

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1   last claim which is Claim 28, trying to get the

2   language up. Well, instead of doing that, I'm

3   going to read the language. So in Claim 28 we

4   are going to carry Steps E and F, but represent

5   the data with a polygonal grid model, right?

6   A.   I'm sorry, again please.

7   Q.   In Claim 28 we're going to carry

8   out Steps E and F but represent the data with a

9   polygonal grid model, correct?

10   A.   Yes.

11   Q.   Okay. And here that language is.

12   And do we have a claim construction for that

13   language?

14   A.   Yes. The Court determined that

15   the phrase means a model of an object that

16   represents the object's surface using a mesh of

17   polygons that form a grid.

18   Q.   And do you have some, something to

19   illustrate what this means in the context of 3D

20   computer graphics?

21   A.   Yes, I do.

22   Q.   So what are we looking at here?

23   A.   Here we're looking at a mesh of

24   polygons. The polygons in this case are

1   triangles. And the mesh, like a mesh of screen

2   wire for example, is created by hooking all

3   these triangles together and the triangles are

4   hooked together in such a way that collectively

5   they define the surface of the terrain. In this

6   case there's a hill in the middle of the image,

7   and this mesh of triangles defines the exact

8   shape of that hill.

9   Q.   And how would we go about building

10   an actual hill on this mesh?

11   A.   I'm sorry, again please.

12   Q.   How would go we go about building

13   an image of a hill from this mesh?

14   A.   Okay. That would be the rendering

15   process. You take this mesh which shows the

16   shape of the surface and you drape an image

17   across there, just like draping a table cloth

18   across a table. And when you do that, you get

19   an image that shows not only the vegetation and

20   other things on the surface, but it depicts the

21   surface shape, in this case the hill.

22   Q.   Do all three groups of Google

23   products employ this concept?

24   A.   Yes, they do.

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1   Q.   For the Group III products I'd

2   like for you to refer back to Tab 42.   The

3   Plaintiff's trial exhibit 75.   And what do we

4   find on the very first page?

5   A.   We found that the subtitle of this

6   presentation is called rendering trillions of

7   triangles in Javascript.   And indeed if you're

8   going to describe the surface of the earth with

9   all of its hills and valleys using these meshes

10   of triangles, you would need trillions of

11   triangles to do it.   And that's what's included

12   in the Google data servers.

13   Q.   And is this consistent with what

14   you found in the Google source code that you

15   reviewed?

16   A.   Yes.

17   Q.   For the Group I products I would

18   like to refer you back to Tab 23 where we've

19   placed a copy of Plaintiff's trial exhibit 141.

20   What is this document?

21   A.   Again, this is a Google document

22   entitled Mirth.

23   Q.   And could you turn with me to the

24   page in this document that ends in 386?

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 1              A.    Okay.

 2              Q.    What, if anything, does this

 3     indicate about the use of meshes and triangles

 4     in the Group I products?

 5              A.    Okay.  I'm sorry, what page are

 6     you talking about?

 7              Q.    The page that ends in 386.

 8              A.    Okay.  Yes.  That.  Yeah.  The

 9     last sentence, rockmesh, which we saw in the

10     software, is the area of the software that keeps

11     track of the data that came down from the

12     server.  It contains a set of textured triangle

13     mesh layers.

14              Q.    And is that consistent with what

15     you found in the Group I source code?

16              A.    Yes, it is.

17              Q.    For Group II, did you hear Mr.

18     Mercay testify about whether meshes and

19     triangles were used for rendering in those

20     products?

21              A.    Yes, he did say that.

22              Q.    And was that consistent with your

23     review of the source code for those products?

24              A.    Yes, it is.
```

1   Q.   And we can go on. And we'll

2   proceed to our check box. So this notion of

3   representing data with a polygonal grid model,

4   is it used in all three of the groups of Google

5   products?

6   A.   Yes, they use that.

7   Q.   So we'll go ahead and check that

8   off. So does that mean that Claim 28 is

9   infringed?

10   A.   Yes, it is.

11   Q.   So in summary, which claims of the

12   '550 Patent have you concluded are infringed by

13   Google?

14   A.   That is Claim 1 and Claim 3 and

15   Claim 14 and Claim 28.

16   Q.   Now, have you given further

17   thought to the significance of this infringement

18   and its important to Google Earth?

19   A.   Yes, I think I mentioned earlier

20   that this is a tremendous job to be able to show

21   the earth to a user the way that Google Earth

22   can do it. It's actually a triumph for computer

23   science, for the field. And I think that having

24   this capability depends on being able to get

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1        that data to the computer fast enough so that it

2        has the access it needs to put those pictures on

3        the screen.  And if you don't do it this way,

4        you're not going to have that experience, that

5        smooth flying over the planet sensation that you

6        get with Google Earth.

7                Q.   And by this way, are you referring

8        to the ways that are claimed in the '550 Patent?

9                A.   I'm sorry?

10               Q.   And by this way in the last answer

11       were you referring to the methods claims in the

12       '550 Patent?

13               A.   Yes, that's what I meant.  The

14       steps laid out in the claims of the patent.

15               Q.   So in your view, is this patent

16       essential to Google Earth?

17               A.   Yes, it is.

18               Q.   Have you reviewed some licenses

19       that Google -- license that Google assigned to

20       Stanford University, with Stanford University?

21               A.   Yes, I have reviewed that license.

22               Q.   Is the technology in that license

23       essential to Google Earth?

24               A.   Actually that describes technology
```

1   that's somewhat of an add on at the end. It's

2   optional. You can use it if you want to or not,

3   but certainly Google Earth could run perfectly

4   fine without that one.

5   Q.   Have you reviewed a license

6   between Google and Activision?

7   A.   Yes.

8   Q.   Is the technology in that license

9   essential to Google Earth?

10   A.   Actually, no. That technology

11   refers to a process that precedes Google Earth,

12   namely creating the models of the buildings in

13   the cities and stuff, so it's just one way to

14   make a model, so Google Earth will work

15   perfectly fine without that.

16   Q.   Doctor Castleman, could you tell

17   us what is essential to Google Earth?

18   A.   Okay. In order to do what Google

19   Earth does the way it does it, you have to have

20   three things. You have to have the hardware,

21   and that includes the Google servers on the

22   network with this huge amount of data that are

23   ready to be sent out. You have to have the

24   user's device, whether it's a laptop or a

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 1        desktop or a smartphone.  So those two pieces of

 2        hardware are required.  You're going to have to

 3        have a tremendous of data stored on those

 4        servers, enough data to describe this planet in

 5        painstaking detail.  And the third thing you

 6        need is a technique, a method for making that

 7        data available to a computer that's no bigger

 8        than your smart phone in a way that it can put

 9        it on that screen as fast as you need it if

10        you're going to be flying over this planet and

11        going to Berlin or any other place as quickly as

12        you can go in Google Earth.  So those three

13        things are required in order to make this work.

14                Q.   And who invented that method you

15        described?

16                A.   The method that I'm talking about

17        is the method that's laid out in this --

18        described in this patent and laid out in the

19        claims.

20                Q.   Have you come up with a way, a

21        conceptual way of illustrating these three

22        essential items?

23                A.   Oh, yes.  I think of these three

24        components as a three-legged stool, because all
```

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1   three legs are required to hold this thing up

2   and if you were to take away any one of those

3   legs of the stool, it would fall down and you

4   wouldn't have Google Earth working like Google

5   Earth.

6   MR. SPEARS: Pass the witness.

7   THE COURT: Would this be a

8   convenient time for us to take our lunch hour?

9   MS. WILLIAMSON: I think it would

10   be, Your Honor.

11   THE COURT: Okay. So the jury is

12   excused for lunch and do not discuss the case.

13   Return at quarter of 2.

14   (Jury exits.)

15   THE COURT: Is there anything else

16   that we need to do?

17   MR. PARTRIDGE: Nothing from

18   Plaintiff, Your Honor.

19   MR. SNYDER: Nothing from

20   Defendants, Your Honor.

21   THE COURT: All right. We'll see

22   you at quarter of 2.

23   (Luncheon recess.)

24   THE COURT: Before we bring the

1   jury back in, I have been working on the final

2   jury instructions and I made some significant

3   revisions in a draft of damages discussion with

4   the heading 22, entire market value rule. And I

5   thought I would give you copies of my tentative

6   redraft of that section so that you can consider

7   it in connection with damages testimony and

8   cross-examination that's going to be offered.

9   We can discuss this at the break

10   this afternoon if you would like to. I don't

11   think that small saleable unit or entire market

12   value rule has much significance in the context

13   of case and I have tried to articulate the

14   necessary findings in a different way.

15   So there are two copies here for

16   each side. And if you could give those to the

17   lawyers.

18   MR. SNYDER: Thank you. Anything

19   else before we bring the jury back in?

20   MR. SNYDER: Nothing further, Your

21   Honor.

22   MR. PARTRIDGE: Nothing from the

23   plaintiff.

24   THE COURT: Okay.

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 1                    (Jury entering the courtroom at

 2       1:45 p.m.)

 3                    THE COURT:  Be seated, please.

 4       Welcome back.

 5                    Mr. Williamson, cross-examination.

 6                    MR. WILLIAMSON:  Thank you, Your

 7       Honor.  May I approach with a witness binder?

 8                    THE COURT:  Yes.

 9       BY MR. WILLIAMSON:

10                    Q.   Good afternoon, Dr. Castleman.

11                    A.   Good afternoon.

12                    Q.   My name is Brett Williamson and

13       I'm one of the attorneys for Google here in the

14       trial and I'm going to ask you some questions to

15       follow up on the testimony you gave this

16       morning.

17                    A.   Please to meet you.

18                    Q.   I want to start with some of your

19       background.  And you testified this morning that

20       you have done some work for NASA; correct?

21                    A.   That's right.

22                    Q.   I just want to be clear, you're

23       not working for NASA now in connection with this

24       trial; correct?
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 1                    A.    That's correct, I left JPL in

 2        1985.

 3                    Q.    And you don't have any opinion

 4        that NASA is using ACI's '550 patent; correct?

 5                    A.    That's correct.

 6                    Q.    And you also mentioned that you

 7        had done some work defending the patent office

 8        from some lawsuits; is that correct?

 9                    A.    That's correct.

10                    Q.    But you're not appearing here at

11        this trial on behalf of the patent office;

12        right?

13                    A.    No, not at all.

14                    Q.    And, in fact, for this case, you

15        have been hired by ACI to provide testimony;

16        correct?

17                    A.    That's right.

18                    Q.    You're doing that as a paid

19        consultant?

20                    A.    Yes.

21                    Q.    And am I correct that ACI is

22        paying you $400 per hour for your testimony?

23                    A.    That's right.

24                    Q.    And I think you said on your
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 1        direct examination that you had spent about 250

 2        hours so far?

 3                A.    That is on the infringement part

 4        of the case.  The total is a little over 310

 5        hours.

 6                Q.    So we're talking about, using your

 7        hourly rate about $102,000 so far; correct?

 8                A.    Whatever the math adds up to, yes.

 9                Q.    Now, you would agree with me based

10        on your review of the '550 patent that it

11        relates to the field of geographical information

12        systems; correct?

13                A.    No.  Actually the patent office

14        search field was not geographical information

15        systems as I recall, it was computer graphics

16        which is a branch of digital imaging processing.

17                Q.    Dr. Castleman, you would call the

18        area of the '550 related to the field of

19        geographical information systems, wouldn't you?

20                A.    No.  It's digital image

21        processing.  The patent itself goes beyond

22        geographical information systems.

23                Q.    And I understand it goes beyond

24        geographical information systems in your
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 1        opinion, but you would agree with me that it's

 2        related to the area of geographical information

 3        systems; correct?

 4                 A.   Definitely related.

 5                 Q.   If I use GIS to refer to

 6        geographical information systems, will you

 7        understand what I mean?

 8                 A.   Yes, I will.

 9                 Q.   Now, you have never written source

10        code for a GIS product yourself; correct?

11                 A.   That is correct.

12                 Q.   And you have never worked on

13        hardware for a GIS product; correct?

14                 A.   As I recall, no, I have not.

15                 Q.   Now, ACI's counsel asked you about

16        your book, Digital Imaging Processing.  And your

17        book isn't about geographical information

18        systems; correct?

19                 A.   It's about the digital imaging

20        processing which includes geographical

21        information systems.  There is a chapter, I

22        think chapter eight that talks about a lot of

23        the basic computer graphics involved in

24        geographical information systems.
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 1                    Q.   But your book doesn't use the term

 2      geographical information systems anywhere in it;

 3      correct?

 4                    A.   Probably not.  I'm not sure.

 5                    Q.   It doesn't even use the word

 6      "geographical"; right?

 7                    A.   I'm not sure.

 8                    Q.   Or geography, it doesn't talk

 9      about any of those things; correct?

10                    A.   Not as I remember.

11                    Q.   I hope I have this testimony

12      right.  It was towards the end of the morning,

13      and you were asked to describe generally the

14      '550 patent and the advances that were made by

15      the inventors at ACI in your opinion.  I think

16      you said that the patented invention allowed a

17      user to take all of this worldwide geographic

18      data and use it in a display system to show

19      smooth and continuous flying over the earth.

20      Does that sound about right?

21                    A.   Basically correct, yes.

22                    Q.   And that's what you believe the

23      inventors invented in the '550 patent?

24                    A.   Well, what the inventors invented
```

1   in the '550 patent is basically what's described

2   in the patent. The description in the patent

3   goes into great detail about the method that

4   they developed to make this information

5   available. Of course the claims give you the

6   limits of what it is that they have claimed in

7   the patent.

8   Q.   But it's your opinion that when

9   you said that you believe that's what ACI

10   invented, that they were the first to do that,

11   correct? That's your opinion?

12   A.   Well, we had the patent and the

13   patent was allowed by the patent office, so

14   that's what I'm saying. I'm taking the patent

15   at face value.

16   Q.   I want to ask you about your

17   description of the invention and I want to do it

18   with respect to the first exhibit. It's

19   actually in the pocket of your binder. We just

20   added it. And it's Exhibit DTX-1076.

21   A.   Okay.

22   Q.   And this is a United States patent

23   number 4972319 to Delorme?

24   MR. SPEARS: Objection. This case

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 1        is about infringement, not invalidity.

 2                    MS. WILLIAMSON:  That would have

 3        been fine had the witness not testified what he

 4        believed the novel approach to the '550 Patent

 5        was, Your Honor.

 6                    THE COURT:  Counsel, approach the

 7        bench, please.

 8                    (Side bar discussion.)

 9                    MS. WILLIAMSON:  Your Honor, I was

10        going to say I'm simply responding to the

11        question elicited at the end of the testimony

12        that the novel feature of the '550 Patent was

13        this continuous flying.

14                    THE COURT:  Just a couple

15        questions?

16                    MS. WILLIAMSON:  Two questions.

17                    MR. SPEARS:  No objection.

18                    THE COURT:  Okay.

19   BY MR. WILLIAMSON:

20            Q.   Doctor Castleman, this is one of

21        the patents that you looked at as part of this

22        case, correct?

23            A.   Yes, it is.

24            Q.   Okay.  I want to ask you to turn
```

1   to Column 29. And Mr. Ang, I'll ask you to pull

2   up lines 32 through 52. As the jury probably

3   already knows, these patent documents are very

4   small typed, so I'd like to highlight some of

5   the language. Column 29 begins towards the top

6   of what we're seeing on the screen, the new

7   invention provides users with the ability

8   graphically to view mapping data from any part

9   of the worldwide database graphically on a

10   monitor either by entering coordinates and a

11   level of zoom or magnitude on the keyboard or by

12   flying to that location in the step zoom mode

13   using consecutive clicks of the mouse or other

14   pointing device. Once a location has been

15   chosen, this point becomes the user defined

16   screen center. The mapping software accesses

17   all adjacent tiles needed to fill the entire

18   view window of the monitor and then projects the

19   data to the screen. Same scale scrolling is

20   accomplished by simply choosing a new screen

21   center and maintaining the same magnitude.

22   And now my question is, Doctor

23   Castleman, I want to go back to the top, to the

24   first page of this document. First page. And

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1   if you look at the date that the patent

2   application was filed, September 25th, 1987,

3   correct?

4   A.   That's right.

5   Q.   And it was issued November 20th,

6   1990, correct?

7   A.   Yes, it was.

8   Q.   So the portion I just read to you,

9   that certainly wasn't first invented by ACI,

10   correct?

11   A.   The general description of what's

12   going on here, no. It obviously was published

13   in -- this patent which was applied for in '87.

14   Q.   Okay. Let's go back to column 29.

15   Picking up where I left off, the next paragraph,

16   the patent goes on to say vertical zooming up or

17   down is accomplished by choosing another

18   magnitude or level from the menu area with the

19   pointing device or by directly entering location

20   and magnitude on the keyboard. An advantage of

21   this vertical lineage of tiles organized in a

22   quadtree structure is that it affords the

23   efficient and easily followed zooming continuity

24   inherent in the present invention. And again,

 1   you understand that ACI in 1995 didn't invent

 2   that concept in this patent from 1987, correct?

 3   A.   They didn't invent the concept

 4   that's described in this patent, yes.

 5   Q.   Now, at the beginning of your

 6   testimony this morning you said that the '550

 7   Patent solves the problem of how to put a

 8   display of the entire earth on a cell phone.

 9   That was your testimony, correct?

10   A.   Yes.

11   Q.   Okay. But the video that you

12   showed to the jury, that wasn't any product made

13   by ACI, correct?

14   A.   That's correct.

15   Q.   That was Google Earth that you

16   showed the jury, correct?

17   A.   Yes, it was.

18   Q.   And you're not aware of whether

19   ACI ever made a product that could display the

20   entire earth on a cell phone, are you?

21   A.   Not that I recall, no.

22   Q.   So I want to ask you now to look

23   at what's been marked as PTX-1. It's the '550

24   Patent. Of course we've looked at it a bit in

1   the trial already, including this morning. And

2   let's go to column 10, which is Claim 1.

3   A.   Do I have that in my tab?

4   Q.   It should be your -- it's the Tab

5   1 from your first notebook and tab -- from the

6   notebook you had this morning, it will be the

7   first tab you have, Doctor Castleman.

8   A.   Okay. Thank you.

9   Q.   You'll probably want to keep that

10   one handy this afternoon.

11   A.   All right. Very good.

12   Q.   What I'm showing you now is Claim

13   1 and the first question I want to ask you is

14   you understand that there was an original

15   version of the '550 Patent that was issued in

16   the year 2000, correct?

17   A.   That is my recollection, yes.

18   Q.   And then there was a first reissue

19   sometime around 2007 of the '550 Patent subject

20   matter?

21   A.   If I remember correctly, that's

22   what happened, yes.

23   Q.   And then a second reissue or a

24   third patent that's the '550 Patent issued in

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 1        2013, correct?

 2                 A.    That's my understanding, yes.

 3                 Q.    And you understand that neither

 4        that first nor the second reissue application

 5        made any substantive changes to Claim 1, such

 6        that it would make a difference as to whether

 7        Google is infringing, correct?

 8                 A.    Yes, that's my understanding as

 9        well.

10                 Q.    Now, with reference to Claim 1,

11        you understand that each and every one of the

12        steps in this claim need to be performed in

13        order for someone to infringe the claim,

14        correct?

15                 A.    That's correct.

16                 Q.    And if I could take you now to

17        Claim 3, and here we should include Claims 2 and

18        3 and that same rule about each and every claim,

19        each and every step or element of the claim,

20        that also applies to the other claims that ACI

21        is accusing Google of infringing, correct?

22                 A.    Yes.  In order to infringe it

23        would have to include all the steps of all the

24        claims it depends from.
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1   Q.   And when you say depends from, so

2   for instance Claim 3 says it's the method of

3   pictorial representation defined in Claim 2, and

4   if we look at Claim 2, it describes the method

5   of pictorial representation defined in Claim 1.

6   So for Claim 3 to be infringed, Google has to

7   perform each and every one of the steps in Claim

8   1, the additional step in Claim 2 and the

9   additional step in Claim 3, correct?

10   A.   Yes, that is my understanding.

11   Q.   And for claim 14, you don't need

12   to show it, but the same concept applies, you

13   understand that claim 14 depends from claim 1,

14   and therefore, in order for Google to be found

15   infringing claim 14, ACI needs to prove that

16   Google does every step of claim 1 plus the

17   additional step of claim 14; correct?

18   A.   That's correct.

19   Q.   And the same question with respect

20   to claim 28, each and every step of claim 1

21   needs to be performed by Google for it to be

22   found infringing claim 28 as well as the extra

23   subject matter of claim 28; correct?

24   A.   That's right.

1   Q.   So let's go back to claim 1,

2   Mr. Ang. And I want to look first at step E of

3   claim 1.

4   Representing the data for the

5   field of view in a pictorial representation

6   having one or more sections.

7   And I think I understood this from

8   your testimony this morning, in the '550 patent,

9   the data for a field of view can be one section;

10   correct?

11   A.   One or more, yes.

12   Q.   And in your examples that you used

13   this morning, you were using an example of one

14   section that had been represented as a result of

15   the performance of steps A through E; correct?

16   A.   One frame I think, steps A through

17   E produced one frame which was most likely made

18   up of multiple sections.

19   Q.   Let me follow-up on that. The

20   pictorial representation that you were talking

21   about, the pictorial representation when you

22   were describing the performance of these steps,

23   you described that as one representation on the

24   screen; correct?

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 1                    A.   Yes.

 2                    Q.   And that one representation on the

 3      screen represents in a display format the field

 4      of view; correct?

 5                    A.   That's right.

 6                    Q.   Now, the beginning of step F after

 7      step E addresses the case where one or more of

 8      the sections that are produced by claim E has an

 9      image resolution below a desired image

10      resolution.  Do I have that right?

11                    A.   Yes.

12                    Q.   So that's what I want to talk to

13      you about now.  This case where one of the

14      sections has an image resolution below the

15      desired image resolution.

16                    And just for the benefit of all of

17      us here, that basically means that this initial

18      image, it's too blurry for its desired use by

19      the user, right, or it's too coarse, it's low

20      resolution; is that right?

21                    A.   Yes, that's correct.

22                    Q.   Now, I want to take you through

23      step F.  And the first part of this says using a

24      computer, dividing each of the one or more
```

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1   sections having image resolutions below a

2   desired image resolution. So dividing each of

3   these sections. And I want to show one of your

4   slides, make sure I understand your testimony

5   about claim F. And if we could bring up slide

6   16. And this is one of your slides that you

7   talked about this morning; correct,

8   Dr. Castleman?

9   A.   Yes.

10   Q.   And if you need to refer to them,

11   they're in the notebook that I handed you. I

12   believe it's tab H. But you can see the slide

13   on your screen?

14   A.   Yes, I can. It's fine.

15   Q.   Now, these blue nodes, they are

16   the same as the smaller sections that we just

17   talked about; correct?

18   A.   Those nodes contain images that

19   cover a smaller area of the earth at a higher

20   resolution than the parent node, which is black.

21   Q.   And under the language of step F,

22   those are the smaller sections; correct?

23   A.   The blue ones are the smaller

24   sections, yes.

1   Q.   Now, the requesting step means

2   that higher resolution image data, and if we go

3   back to claim 1 actually is probably the best

4   way to do this.   Keeping in mind these blue --

5   let's do this on a split screen.   This makes no

6   sense.

7   So what I'm showing you now,

8   Dr. Castleman, is your slide 16 and the language

9   of claim F and I'm reading claim F, it says

10   dividing each of the one or more sections having

11   image resolutions below a desired image

12   resolution into a plurality of smaller sections.

13   You just testified those are the blue nodes?

14   And then requesting higher

15   resolution space related data for each of the

16   smaller sections.   And that's how step F of

17   claim 1 works; correct?

18   A.   Yes, that's what it says.

19   Q.   And so here each of the smaller

20   sections would be like these blue nodes on the

21   left-hand side of the screen; correct?

22   A.   It could well be those four, yes.

23   Q.   And sometimes we call those child

24   nodes using this family metaphor, I think you

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 1     talked about that this morning.  And if we did

 2     that here, those would be the child nodes in

 3     blue and the grandchild nodes in red; is that

 4     right?

 5                 A.   That's right.

 6                 Q.   Now, in step F after this

 7     requesting step, each of the smaller sections

 8     that was requested must be stored as required by

 9     the claim; correct?

10                 A.   Yes.

11                 Q.   Now, when we say each of the

12     sections that was requested that then needs to

13     be stored, centrally storing means what you

14     talked about to the jury this morning; correct,

15     that is actually having that data put on the

16     local device; correct?

17                 A.   That's right.

18                 Q.   Now, in step F of claim 1 after

19     the storing step, the substep of quote

20     representing the data requires that each of the

21     smaller sections that is stored is then

22     represented under step F; correct?

23                 A.   Well, it says representing the

24     data for the field of view in the pictorial
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 1        representation.

 2                    So it would only represent the

 3        data for those child nodes that fall within the

 4        field of view.  But yes, with that in mind, you

 5        are correct.

 6              Q.   That is a helpful clarification.

 7        I appreciate that.  So excluding the child nodes

 8        that fall outside the field of view, step F

 9        requires that every one of the smaller sections

10        that's within the field of view that has data

11        stored for it has data then represented;

12        correct?

13              A.   Yes, it says representing the data

14        for the field of view in a pictorial

15        representation, yes.

16              Q.   That's for each of the child

17        nodes; correct?

18              A.   For each of the child nodes that

19        are in the --

20              Q.   In the field of view?

21              A.   In the field of view.

22              Q.   That's how we already defined the

23        tree because we started with the first node that

24        was the field of view; correct?
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 1                    A.   It would be possible when you look

 2      at a parent node, all of its child nodes might

 3      not be in the field of view.  So some of those

 4      four blues, maybe all of them, maybe some of

 5      them would fall inside the field of view, and

 6      those would be stored and represented.

 7                    Q.   We are on the same page.  That's

 8      what I understand.  I just want to understand

 9      your testimony about claim F, that's what I'm

10      getting at.

11                    I want to switch gears and ask you

12      about your investigation regarding the Google

13      Earth products.  And as part of your work on

14      this case, you looked at three different

15      groupings of Google products; correct?

16                    A.   That's right.

17                    Q.   And those were listed in one of

18      your slides, I think it's tab H of your notebook

19      and we have it on the screen now.  And this is

20      your slide that you discussed during your direct

21      testimony this morning; correct?

22                    A.   That's right.

23                    Q.   And it's your testimony there are

24      specific software programs that are used to run
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1   these various Google Earth products; correct?

2   A.   Yes. The products in each of

3   these groups uses the same Google Earth

4   software.

5   Q.   And one of these things that the

6   software that Google Earth uses in these

7   products that you discussed this morning, they

8   use something called multiple threads; is that

9   right?

10   A.   That's correct, they do.

11   Q.   And by multiple threads means

12   there can actually be parallel operations

13   happening while Google Earth is processing these

14   various nodes; is that right?

15   A.   Yes, basically different routines

16   can be running at the same time.

17   Q.   And the software in each of these

18   groups for the Google Earth products does

19   something called traversing a metadata tree;

20   correct?

21   A.   That's right.

22   Q.   You talked about that a little bit

23   this morning and I wanted to go over it so that

24   I understand your testimony and the jury does as

1   well. Let me show you again the diagram that

2   you showed during your direct examination. It's

3   at page 44 I think of your slides. Again, if

4   you need to refer to it, it's in tab H. But

5   this is -- that's the one.

6   And you recognize this as one of

7   the slides you showed the jury this morning;

8   correct, Dr. Castleman?

9   A.   Yes, it is.

10   Q.   And what we're seeing here is your

11   interpretation of how claim Steps F and G would

12   work showing actual imagery; is that right?

13   A.   That's correct.

14   Q.   And a metadata tree includes both

15   parent nodes and child nodes, like this diagram

16   that we're showing on the screen here, correct?

17   A.   Right. Now, some of the software

18   talks about metadata trees. It makes a

19   distinction between one tree that contains the

20   imagery and one tree that contains data about

21   the imagery. And in my discussion, in order to

22   keep things simpler for the jury, I didn't make

23   a distinction between the image tree and the

24   metadata tree. I kind of merged them both

1   together. So I don't believe the jury has been

2   informed about this, this distinction that's

3   made with the metadata tree.

4   Q.   Yeah, I think you're right. I

5   don't think they have been. In fact, in the

6   Google Earth products there's actually two

7   different types of trees that are traversed in

8   some cases, correct?

9   A.   It's considered that way in the

10   software although they are parallel, one

11   contains image data and one contains other data

12   about the same images.

13   Q.   Now, I want to ask you a question

14   because in your testimony I didn't hear any of

15   the software that you went over being described

16   as defining the dividing step at the beginning

17   of Step F of the claim; is that right?

18   A.   No, I think I pointed out the

19   routines that do the dividing.

20   Q.   Okay. But there's nothing in the

21   software that you showed the jury that you

22   pointed to to describe dividing or sounded like

23   dividing or was similar to fetching or rendering

24   or any of the other terms you used? We didn't

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 1        see anything about dividing in the software,

 2        correct?

 3               A.   Traversing the tree is exactly the

 4        process of dividing.  That's how the dividing is

 5        done.  By moving down that tree you go to the

 6        smaller and smaller images, the child nodes that

 7        make up the parent node.

 8               Q.   Okay.  Thank you for that

 9        clarification because that's exactly what I was

10        looking for.  In your opinion, the Google Earth

11        products satisfy the dividing step by traversing

12        this metadata tree; is that right?

13               A.   Yes.

14               Q.   Now, you've provided opinions in

15        this case and I'm going to speak at a higher

16        level, I think, than some of the software code

17        being talked about, but I want to make sure I

18        accurately summarize your opinion.  That is

19        software in each of the three groups of products

20        that you examined examines this metadata tree

21        for at least two purposes, correct?

22               A.   Okay.  Can you -- I think you're

23        right.  But can you tell me what those two

24        purposes are to make sure we're on the same
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 1        page?

 2               Q.   Absolutely, very good idea, Doctor

 3        Castleman.  It's your opinion that there's at

 4        least two purposes and one of those is to

 5        determine whether the metadata tree node falls

 6        within the field of view, correct?

 7               A.   That's one purpose for traversing

 8        the tree, yes.

 9               Q.   And there's a second purpose for

10        traversing the tree that's for determining if

11        the metadata tree node is at an appropriate

12        resolution, correct?

13               A.   That's right.  And there's another

14        stopping criteria.  We're talking about Step G

15        here, two stopping criteria; one is if you've

16        got the resolution as high as you need it and

17        the other one is if you've gone as far as you

18        can go down the tree.

19               Q.   I'm just talking about the two

20        tests that are run in the software that we saw.

21        There's a field of view test and an appropriate

22        resolution test; is that correct?

23               A.   That's correct.

24               Q.   And you've referred to it as a
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 1        resolution test in some of your opinions,

 2        correct?

 3               A.   That's right.

 4               Q.   Okay.  Now, you've also explained

 5        and I think you did that this morning that this

 6        resolution test is related to something called

 7        the Lod culling?

 8               A.   That's right.  That's what it's

 9        called in the software.

10               Q.   And this morning you defined

11        culling as eliminating the things you don't

12        need; is that right?

13               A.   It's basically that.  It's

14        determining on a node by node basis whether you

15        need to have the data that's included in that

16        node.

17               Q.   And Lod stands for level of

18        detail, correct?

19               A.   Yes, it does.

20               Q.   And you cited to some specific

21        source code files from your review of the

22        accused Google products that talk about this

23        process and I want to show you a few of those.

24        Let's first look at Page 46 and this was one of
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 1        your slides from this morning, correct?

 2               A.   Yes.

 3               Q.   And the passLod source code,

 4        that's one of these Lod culling or resolution

 5        tests, correct?

 6               A.   Yes, it is.

 7               Q.   And if we look at 47, we see

 8        passesLod and for the Group II products that's

 9        another resolution test or Lod culling, correct?

10               A.   Yes, it is.

11               Q.   And then if we look at 45 for the

12        Group III products, LodManager, that's another

13        resolution test or Lod culling, correct?

14               A.   Yes, that one includes the Lod

15        test.

16               Q.   Now, based on these tests that are

17        being performed in the Google products when the

18        metadata tree is traversed, there are some nodes

19        that get traversed which are not subsequently

20        requested, correct?

21               A.   That is correct, yes.

22               Q.   And that even includes some nodes

23        that are not within the field of view, correct?

24               A.   That's right.
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 1                    Q.   And there are actually are some

 2      nodes for which image data is requested that are

 3      within the field of view, but the data is not

 4      rendered or represented, correct?

 5                    A.   I'm not sure which ones that would

 6      be.

 7                    Q.   And you're not sure which ones

 8      that would be because you've never performed

 9      that analysis?

10                    A.   No, I'm not sure what you're

11      talking about there, about nodes that are

12      requested and not displayed.

13                    Q.   Sure.  Let me ask you.  Is it true

14      that in the Google traversal process of the

15      metadata tree, there are some nodes for which

16      image data is requested, but that image data is

17      not rendered or represented?

18                    A.   Not aware of any of those.

19                    Q.   But you wouldn't actually know

20      because you never performed an analysis to

21      determine whether that's the case, correct?

22                    A.   What I can say is from my, from my

23      use of the product and from my analysis of the

24      software and the Google documents and the
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1   deposition testimony that I don't recall seeing

2   anything that tells me that nodes data was

3   requested and never used.

4   Q.   My question is slightly different.

5   I'm asking you if part of your investigation in

6   this case of the Google Earth products, whether

7   you did any analysis to determine how often it

8   happens that nodes that get traversed don't get

9   requested or nodes that are stored don't get

10   rendered. You just haven't done that analysis,

11   correct?

12   A.   Can you give me the primers of

13   that analysis? Make sure I have it straight?

14   Q.   Sure. I'm just asking whether you

15   did any analysis that would address the question

16   of whether any nodes get ignored after data has

17   been requested for them?

18   A.   Yeah. I don't recall specifically

19   looking at that question.

20   Q.   So I want to turn to step G of

21   claim 1. If you can put PTX 1 back up. And

22   step G is the part we looked at this morning

23   during your testimony that requires that the

24   accused process or accused method repeats step

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 1        F.   And in order to perform step G in claim 1,

 2   you have to first perform step F; right?

 3             A.   That's correct.

 4             Q.   And by performing step F, that

 5   means you have to perform all of the substeps of

 6   step F; correct?

 7             A.   Yes.

 8             Q.   Nothing in claim G says you only

 9   need to perform some of the substeps in step F

10   before repeating; correct?

11             A.   That's right.

12             Q.   So again turning to the Google

13   products with respect to step G, I think I

14   understood your opinion this morning to be that

15   Google infringes step G because it performs all

16   the substeps of step F and then repeats them; is

17   that correct?

18             A.   That's right.

19             Q.   And so you would agree with me,

20   wouldn't you, that if Google didn't perform all

21   the steps, the substeps of step F of claim 1, it

22   couldn't infringe step G; correct?

23             A.   I don't recall looking

24   specifically at that question, but as we sit
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 1        here today, it strikes me that the answer to

 2        your question is yes.

 3                    Q.   And just so we remember what my

 4        question was, if Google didn't perform all the

 5        steps, substeps of step F, it couldn't infringe

 6        step G of the -- of claim 1 of the '550 patent;

 7        correct?

 8                    A.   Well, obviously it would have to

 9        perform all the steps of the claim in order to

10        infringe the patent.  And if I am understanding

11        your question correctly, it sounds like you have

12        set up a situation where all the steps of the

13        patent would not be executed.  And then again if

14        Google software failed to execute all the steps

15        of the claim, then it would not infringe.

16                    Q.   That's close to my question.  I

17        was asking a question specifically about the

18        operation of F and G together.  So just ask it

19        again for clarity.  You would agree with me, if

20        Google didn't perform all the substeps of step

21        F, then it couldn't infringe step G; correct?

22                    A.   Okay.  Yeah, because step G said

23        repeating step F, as I'm interpreting that, that

24        would mean repeating all the substeps of step F.
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1   Q.   Now, turning to claim 3, which is

2   the step relating to the method of pictorial

3   representation defined in claim 3, further

4   including determining the data and/or the

5   coordinates of the data in terms of a new

6   coordinate system. You showed the jury some

7   marketing documents from Google, but you didn't

8   show the jury any source code that relates to

9   claim 3; correct?

10   A.   As I recall, I didn't -- I want to

11   show the jury that going through the source code

12   is as tedious and as boring to me as it is to

13   you. And I tried to get the point across with

14   as little of that as possible. As I recall,

15   none of the source code I saw actually executed

16   a change of coordinates.

17   Q.   That's the answer I wanted. And

18   you understand to Google, while it might be

19   tedious, it's very important, very important

20   that you and anyone else giving testimony make

21   sure that they have evidence to back up the

22   accusation that Google is infringing, you

23   understand that; right?

24   A.   Absolutely.

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1   Q.   In your direct testimony you

2   grouped Google Earth products into three groups.

3   Let's go back to tab H, page four. And there is

4   a reference under the group 2 products that says

5   everything else going back to 2008. I'm going

6   to ask you a broader question. And it's

7   correct, isn't it, that you never analyzed any

8   of the Google Earth products prior to 2008;

9   correct?

10   A.   I didn't analyze any software

11   which dated back beyond 2008.

12   Q.   And your analysis also didn't

13   distinguish between different versions within

14   groups; correct? For instance, if there is more

15   recent versions or older versions of the

16   products that you listed here, your analysis

17   didn't distinguish between those versions, at

18   least within a group?

19   A.   That's correct, it wasn't

20   necessary because all the products within a

21   group work the same way.

22   Q.   I'm going to ask you a couple of

23   questions about some of the specifics here. The

24   first is your reference to Earth for Audi. You

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 1        didn't do any separate analysis of source code

 2        that relates to Earth for Audi; correct?

 3               A.   I didn't analyze any source code

 4        that came from Audi, but I did see the source

 5        code that was licensed to Audi by Google.

 6               Q.   You have reviewed various

 7        depositions in this case; correct?

 8               A.   Yes, I have.

 9               Q.   Including of some of the Google

10        engineers?

11               A.   Yes.

12               Q.   And you understand that Google

13        when it licenses its software for a version of

14        Earth for Audi, it allows Audi's engineers to

15        build their own software application?

16               A.   Yes, but subject to the license

17        agreement.

18               Q.   Subject to the license agreement.

19        But the specific license agreement for Audi, did

20        you analyze whether the Audi engineers had built

21        their own software applications consistent with

22        their license for Google?

23               A.   If I understand your question

24        correctly, did I determine whether or not Audi
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 1        engineers violated the license agreement, that

 2        is what you're asking?

 3                Q.   No, I didn't ask that at all.  Did

 4        you analyze the question of whether Audi

 5        engineers were allowed by Google because of the

 6        special Google and Audi relationship to build

 7        their own software application?

 8                A.   I have seen the license agreement

 9        under which Google made Earth to Audi, my

10        recollection is that license agreement doesn't

11        allow them to make substantial modifications to

12        the software.  But I don't have it in front of

13        me, so I'm working from memory here.

14                Q.   I understand you're talking about

15        they can't make substantial modifications to the

16        software.  That's what you're relying on?

17                A.   It's whatever the agreement said.

18        I don't have it in front of me, but I know it

19        was very limited as to what they can do.

20                Q.   Let me go back to claim 1 again.

21        And this time let's go to substep A.  And step A

22        that you talked about this morning is requires

23        that the accused product provide a plurality of

24        spatially distributed data sources for storing
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1   space-related data; correct?

2   A.   That's what it relates.

3   Q.   Do you know if the Google Earth

4   for Audi uses a plurality of spatially

5   distributed data sources for storing

6   space-related data?

7   A.   Yes, to the extent that the Audi

8   software gets its data from the Google Earth

9   data sources.

10   Q.   Do you know whether the Google

11   Earth for Audi product gets its data from the

12   Google Earth data sources?

13   A.   I know that the software that was

14   licensed to Audi calls up data from the Google

15   data servers. Whether Audi engineers might have

16   somehow changed that, I don't know.

17   Q.   You wouldn't know that because you

18   didn't do that analysis?

19   A.   That's correct.

20   Q.   Let's go back to the slide, page

21   four. And there is a reference to under group 2

22   to free or enterprise or Pro. And you didn't do

23   any analysis of whether the customers who

24   licensed Google Earth enterprise configured or

1   didn't configure their product to use the Google

2   servers, did you?

3   A.   No, I didn't. I saw the software

4   that they were licensed and I believe I saw the

5   license agreement they were given, but what I

6   didn't see was the software after they got it

7   from Google and implemented it on their own

8   machines.

9   Q.   So you didn't do the analysis to

10   see whether they had actually done that in the

11   implementation step, correct?

12   A.   Not for Google -- not for software

13   that belongs to the people who license

14   Enterprise.

15   Q.   You talked a little bit in your

16   testimony about what you think the value of the

17   '550 Patent is as it relates to Google's use.

18   It's not your opinion, is it, that every time

19   Google Earth is downloaded that there's an

20   instance of infringement, is it?

21   A.   My understanding is that if you

22   were to download and install Google Earth on

23   your smartphone, for example, that that process

24   by itself would not infringe the claims of the

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 1        patent.

 2                 Q.   And if you simply opened the

 3        application but didn't do any of the navigation

 4        or any of the other steps you described, it's

 5        not your opinion that the Google Earth products

 6        infringe the '550 Patent?

 7                 A.   Actually I looked into that and it

 8        turns out that it does.

 9                 Q.   And you believe it does so because

10        when you open the application it automatically

11        brings up the glove; is that correct?

12                 A.   It does.  It brings up a globe

13        which is fuzzy at first and then it gets

14        sharper, so it goes through the steps of the

15        claim to present that high resolution of the

16        earth that you see when you first open the

17        program.

18                 Q.   And it only does that when it's

19        connected to a data source, correct?

20                 A.   Yes, it has to have access to the

21        internet in order to contact the servers and get

22        the data that it needs to do that.

23                 Q.   Let's put up 872.  This was your

24        three-legged stool that you talked about.  And
```

1   just so I understand, Doctor Castleman, it's

2   your testimony that Google Earth is made up of

3   three different types of assets or value that go

4   into it. You've divided Google Earth into three

5   things that make up the product; is that right?

6   A.   I believe the question I was asked

7   were what do you have to have to do Google

8   Earth, so these are the three requirements that

9   you need in order to make Google Earth work.

10   Q.   And I see that there's no --

11   there's no leg of this stool that's just labeled

12   software, correct?

13   A.   Right.

14   Q.   So you're assuming that all of the

15   software that goes into this Google Earth

16   product that you showed the jury this morning

17   that zoomed down to that level of detail, all of

18   that is attributable to the 550 method claim; is

19   that right?

20   A.   No, obviously. Obviously you need

21   the software that comes with the smartphone, you

22   need all the other software. I just didn't

23   include it in this graphic. The question was

24   what are the three essential ingredients that it

1   takes to make Google Earth work. And that's

2   what I was trying to put forth with this

3   graphic.

4   Q.   I appreciate that. I'm not

5   talking about the software that's on my

6   smartphone or on our computers. I'm talking

7   about the software that Google developed over

8   its 12 years of developing this product to

9   create what we all can use now, the Google

10   software. You're not accounting for any of that

11   other than what you claim is based on the '550

12   Patent in your stool analogy, correct?

13   A.   I'm lumping that in together with

14   the hardware. I could have said hardware and

15   software. It's all the stuff that it takes

16   including the software that comes with your

17   phone, including all the software, as you say,

18   that Google developed over the years, which is a

19   tremendous amount of software. But I was

20   focusing here on the three essential elements

21   that it takes to make Google Earth work.

22   Q.   So this stool should actually have

23   four legs to it, the Google software?

24   A.   Not --

649

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 1                    Q.   Because you acknowledge, don't

 2      you, Doctor Castleman, that the Google

 3      engineers, through a dozen years of development,

 4      have created a product that ACI never created,

 5      correct?

 6                    A.   That's right.

 7                    Q.   Okay.  So one of your four stools

 8      is related to the '550 method claim, but you

 9      have no evidence that Google or Keyhole ever got

10      a single line of software from ACI, correct?

11                    A.   I don't recall seeing that, no.

12                    Q.   Well, the answer is no.  You have

13      no evidence of that, correct?

14                    A.   I don't recall ever seeing

15      anything about that.  And I can't say that it

16      didn't happen.

17                    Q.   And in fact, you've used the

18      Google Earth product, correct?

19                    A.   Yes, I have.

20                    Q.   And it's not your testimony that

21      the '550 method claim would allow a turn by turn

22      driving feature, right, correct?

23                    A.   Google Earth could be used in

24      conjunction with a turn by turn driving
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650

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 1        direction program.
 2                 Q.   It could.  And the '550 Patent
 3        doesn't describe the turn by turn direction
 4        program, correct?
 5                 A.   That's correct.
 6                 Q.   All right.  And neither the '550
 7        Patent or ACI ever developed a tour guide
 8        feature where you could go into a geographic
 9        location and click on and get additional
10        information.  That's not in the '550 Patent,
11        right?
12                 A.   I believe that's correct.  It's
13        not.
14                 Q.   And the '550 Patent doesn't talk
15        about premade videos that give more information
16        about a particular area as Google Earth does,
17        correct?
18                 A.   That's correct.
19                 MS. WILLIAMSON:  No further
20        questions.
21                 MR. SPEARS:  Very brief redirect,
22        Your Honor.
23     BY MR. SPEARS:
24                 Q.   In your opinion, Doctor Castleman,
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651

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 1        is the tour guide feature essential to Google

 2        Earth?

 3                A.   I'm sorry, can I hear that again.

 4                Q.   In your opinion is the tour guide

 5        feature essential to Google Earth?

 6                A.   I'm missing a word here.

 7                Q.   Is the tour guide feature

 8        essential to Google Earth?

 9                A.   Thank you.  No, it's not.

10                Q.   What about the premade video

11        feature?

12                A.   That's a cute addition, but it's

13        not essential to make Google Earth work.

14                Q.   I'd like to hand the witness

15        what's been marked for identification as

16        Plaintiff's trial exhibit 500.  There you go.

17        Is that exhibit the Audi license that you

18        referred to during cross-examination?

19                A.   Yes, it appears to be that.

20                MR. SPEARS:  No further questions.

21                THE COURT:  Okay.  All right.

22        Now, we come to the point to see whether the

23        jurors have any questions.  If you have a

24        question, write it down.  If you don't, pass a
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 1        blank piece of paper.

 2                    THE COURT:  Do we have all the

 3        papers?

 4                    (Side-bar discussion:)

 5                    THE COURT:  There is one question

 6        and one request.  The request is to ask the

 7        parties when they're showing items if they can

 8        expand the documents every time so it's easier

 9        to read them.

10                    MR. SPEARS:  I will keep that in

11        mind.

12                    THE COURT:  And the question is

13        definition of a node.  I heard it several times,

14        but I don't know what the exact meaning is.  So

15        I propose that we ask the witness what a node

16        is.  Is there any objection to that?

17                    MR. SPEARS:  None whatsoever.

18                    MR. WILLIAMSON:  I don't have an

19        objection.

20                    (End of side-bar).

21                    THE COURT:  We have one question

22        from one of the jurors, also a request that the

23        parties in showing the documents expand them so

24        it's easier for you to read them.  And they
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 1        promise to do that.

 2                    The question, Dr. Castleman, is

 3        would you please give us a definition of node.

 4        And the jurors are not sure exactly what it

 5        means.  What exactly is a node?

 6                    THE WITNESS:  What is a node.

 7        Okay.  Good.  Good.  Good.

 8                    As I mentioned earlier, the data

 9        is organized in this tree structure.  And a tree

10        is made up of nothing more than nodes and

11        branches.  And the nodes, this is a conceptual

12        organization.  The nodes are the places where

13        data can live.  You can have an image at a node,

14        you can have terrain data at a node.  The

15        branches merely connect the nodes.

16                    So every picture in this immense

17        Google database resides in one of those nodes.

18        The node is basically the address where that

19        image lives.  The image of San Diego, California

20        at a certain resolution would be located at one

21        of those nodes and in order to find that image,

22        you would work your way down the tree until you

23        find the node that contains the image of

24        San Diego at a particular resolution.
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 1                    And if you go do you know to the

 2       next layer, the child nodes, you'll see other

 3       images of San Diego that cover a smaller area,

 4       but at higher resolution.

 5                    So trees are made up of branches

 6       and nodes.  The nodes are the places where an

 7       image can live.

 8                    And every image in the database

 9       has an address, and that address is the node

10       that it lives in.

11                    THE COURT:  Okay.  Any further

12       questions?

13                    MR. SPEARS:  No.  At this point we

14       would like to move admission of Plaintiff's

15       Exhibits 27, 75, 133, 140 through 41, 176, 223,

16       336, 367 through 72, 375 through 77, 389 through

17       92, 394 through 96, 398, 407, 409 through 410,

18       413 through 416 and 500.

19                    THE COURT:  Any objection?

20                    MR. WILLIAMSON:  No objection.

21                    THE COURT:  Those exhibits are

22       admitted.

23                    MR. WILLIAMSON:  Your Honor,

24       Google moves to admit exhibit DTX 1076.
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 1                    THE COURT:  Any objection?

 2                    MR. SPEARS:  No objection.

 3                    THE COURT:  That exhibit is

 4     admitted.

 5                    Okay.  Dr. Castleman, you're

 6     excused, I assume subject to recall.

 7                    THE WITNESS:  Thank you, Your

 8     Honor.

 9                    THE COURT:  Thank you.

10                    The next ACI witness.

11                    MR. HAWES:  Your Honor, ACI calls

12     Google by its corporate representative Peter

13     Birch who works as a senior project manager at

14     Google.  His testimony concerns various numbers

15     that Google tracks for Google Earth.  The video

16     is about twenty-five minutes.

17                    (Videotape testimony:)

18          Q.   Could you please state your full

19     name?

20          A.   My name is Peter Raymond Birch.

21          Q.   When did you first come to work

22     for Google?

23          A.   I started in May of 2006.

24          Q.   And in what position were you
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 1        hired in?

 2                 A.   As a product manager --

 3                      (End of video.)

 4                      THE COURT:  This is a video, I

 5        assume?  And we're not seeing video.

 6                      (Discussion off the record.)

 7                      (Videotape deposition.)

 8                 Q.   Could you please state your full

 9        name?

10                 A.   My name is Peter Raymond Birch.

11                 Q.   When did you first come to work

12        for Google?

13                 A.   I started in May of 2006.

14                 Q.   In what position were you hired

15        in?

16                 A.   As a product manager.

17                 Q.   For which products?

18                 A.   For Google Earth.

19                 Q.   When you had responsibility for

20        Google Earth, what exactly did you do to support

21        the product?

22                 A.   So I was product manager and the

23        role of product manager has many dimensions, so

24        I would be responsible for the overall roadmap
```

1   and strategy for the product. I would work with

2   engineers to understand particular designs of

3   new features to provide feedback. There is some

4   amount of just overall project management of

5   managing how things are progressing and looking

6   at bugs.

7   There would be working with legal,

8   working with marketing, working with public

9   relations. I did a lot of press on behalf of

10   the product. So generally the face of the

11   product both internally and externally in

12   helping with the overall strategy.

13   Q.   All right. I'll do that. What is

14   Google Earth?

15   A.   So Google Earth is a product

16   family which includes a series of different

17   client applications that is available to both

18   consumers and businesses for basically browsing

19   geo spatial information.

20   Q.   The desktop version of Google

21   Earth, was that first offered, made available to

22   the public in June of 2005?

23   A.   That sounds about correct.

24   Q.   When were the mobile versions of

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 1        Google Earth first offered?

 2                 A.   Without knowing specific dates the

 3        IOS version was in 2008.  I believe it was in

 4        September or October, and then the Android

 5        version I believe was in 2010.

 6                 Q.   Now, the desktop and mobile device

 7        versions of Google Earth, those are offered for

 8        free, correct?

 9                 A.   There are versions that for

10        desktop that are enabled for free and the mobile

11        versions are free.

12                 Q.   What is Google Earth Pro?

13                 A.   Google Earth Pro is a variant of

14        the desktop product that's for sale, you know, a

15        paid version of Google Earth.

16                 Q.   How long has it been offered?

17                 A.   It has been offered ever since,

18        you know, basically we had Google Earth, so

19        Google Earth -- so since 2005, I guess.

20                 Q.   With respect to how terrain

21        information is accessed and rendered, does

22        Google Earth Pro work in a way similar to Google

23        Earth desktop free?

24                 A.   Yes.  So those two products are
```

1   essentially identical in how they, you know, how

2   they operate from a rendering perspective.

3   Q.   What is Google Earth Enterprise?

4   A.   Google Earth Enterprise is a suite

5   of products that we have sold in the past for,

6   for specific provisional use cases.

7   Q.   During what period of time has

8   Enterprise been offered for sale?

9   A.   To the best of my knowledge, from

10   2005 through last year.

11   Q.   Could the Enterprise versions of

12   Google Earth also fetch data from servers

13   maintained by Google?

14   A.   Yes.

15   Q.   And when an Google Earth

16   Enterprise client was run in that way, was the

17   fetch and rendering of data done in essentially

18   the same way as with Google Earth desktop free?

19   A.   Yes.

20   Q.   Are there versions of Google Earth

21   embedded in Audi automobiles?

22   A.   There's a version of Google Earth

23   available in some Audi automobiles, correct.

24   Q.   Okay. Is there a Google Earth for

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 1        BMW?

 2                A.   No, there's not.

 3                Q.   Is there a Google Earth for any

 4        other auto maker?

 5                A.   There is not.

 6                Q.   What were Google's reasons for

 7        making earth available for mobile applications?

 8                A.   So we were very interested in

 9        making Google Earth available to users wherever

10        they are.  And we recognized that mobile was

11        going to be a very popular platform and so we

12        were interested in Earth being part of that

13        platform.

14                Q.   Does Google track one-day active

15        users for any of the Google Earth products?

16                A.   Yes.

17                Q.   Which ones?

18                A.   For all of them.

19                Q.   What about seven-day active users?

20                A.   Yes, we track that for all of them

21        as well.

22                Q.   What are the one-day active,

23        seven-day active and 30-day active user metrics?

24                A.   Sure.  So -- so a one-day active
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 1        user goes -- so there's a notion of a unique

 2        user.

 3                  Q.   Uh-huh.

 4                  A.   And there's a notion of a session.

 5                  Q.   Okay.

 6                  A.   And so let me start with that and

 7        then I'll work to your question.  So a session

 8        is when somebody opens and begins using Google

 9        Earth.  The -- if the same person does that

10        multiple times in a day, that still counts as

11        one unique user.  And so the one-day active is

12        the total number of individuals who have used

13        earth one or more times in a given day.

14                  Q.   Okay.  What about the seven-day

15        active users?

16                  A.   So the seven-day active, so

17        similarly the number of unique users but within

18        a seven-day period.

19                  Q.   Why does Google keep track of

20        those metrics?

21                  A.   We track those metrics because it

22        is one indication of the overall usage and

23        engagement of the product and we're interested

24        in how, how the product is used and how often it
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 1        is used and by how many people.

 2                Q.   And why is Google interested in

 3        that?

 4                A.   Because we're interested in

 5        building a product that is useful to users and

 6        if, you know -- that is one of the ways that we

 7        can determine whether we are succeeding in that

 8        job.

 9                Q.   Does Google track a daily session

10        metric for any of the -- any other Google Earth

11        products?

12                A.   Yes.

13                Q.   For which ones?

14                A.   I believe all of them.

15                Q.   What about a session length

16        metric?

17                A.   So session length is something

18        that, yes, so we do track session length as

19        well.

20                Q.   For all Google Earth products?

21                A.   Yes, there are some different

22        ways -- session length is a more difficult thing

23        to measure, so we have some different ways of

24        looking at that and we do that across products.
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663

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 1              Q.   Why does Google keep track of

 2      activations and daily upgrades?

 3              A.   So we're interested in the number

 4      of new users that come into the product and

 5      we're also interested in the version that

 6      particular users are on and those give us some

 7      indication of that.

 8              Q.   And what, if anything, does Google

 9      do with that information?

10              A.   We use that information to measure

11      the success of different releases and different,

12      you know, activity related to the Google Earth

13      product family.

14              Q.   Showing you what's been marked as

15      Exhibit 13.  Can you tell me what this document

16      is?

17              A.   This is a document showing average

18      session length in minutes for various different

19      versions of Google Earth presumably.

20              Q.   Okay.  Which versions would those

21      be?

22              A.   The version for iPhone, version

23      for iPad, iPod, Android, Audi, Tumbler is a code

24      name for the plug in, MAC is the MAC desktop
```

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 1        version, PC is the PC desktop versions,

 2        including Free and Pro, Lenox is the Lenox

 3        desktop version.  Average is the aggregate

 4        across all clients.  And then the ATVG column is

 5        I believe is a seven-day rolling average.

 6                    Q.   Did Audi pay Google any money for

 7        the Earth module that Google provided them?

 8                    A.   Yes.

 9                    Q.   Can you tell me what that was?

10                    A.   It was a sum over a number of

11        years, which I believe was $70 million.

12                    Q.   And that's the total sum?

13                    A.   That's the total multi-year sum of

14        the agreement, as I understand it.

15                    Q.   As of 2013 when your

16        responsibility shifted away from Earth, what do

17        you recall was your expectation regarding future

18        growth and demand for Earth?

19                    A.   So the expectation was that we

20        continue to show very strong growth on the

21        mobile segments.  And that the, the desktop

22        products were generally flat to declining from

23        usage standpoint because of the overall

24        flattening and declining of the desktop platform
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665

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 1        as a whole in the industry.  And the Earth Pro

 2        revenue was growing on the order of I forget the

 3        specific numbers, but maybe, you know, 15 to 20

 4        percent a year.

 5              Q.   Okay.  I'm handing you what's been

 6        marked as Exhibit 42.  And does this exhibit

 7        identify the prices for certain Google Earth

 8        products as of June of 2008?

 9              A.   Yes.

10              Q.   And are the prices listed here

11        consistent with your recall of what they

12        actually were at that time?

13              A.   Yes.

14              Q.   Do you recall how the $40 license

15        fee was set for Google Earth Pro?

16              A.   The price was based on an earlier

17        pricing for the Pro product families where there

18        was a yearly subscription fee for the product

19        itself and then an additional fee for each of

20        several additional data products that came with

21        the product and in 2000, I believe, 6 or so or

22        maybe 7, the price was combined into a single

23        aggregate price that included both the, the

24        product itself and the, the premium data
```

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 1        product.
 2                Q.   Do you recall how Google went
 3        about setting that price?
 4                A.   No, I do not.
 5                Q.   What about the $20 price for
 6        Google Earth plus, do you know how that was
 7        arrived at?
 8                A.   I believe that was a legacy price
 9        from the pre-acquisition time, but I'm not
10        certain.
11                Q.   Okay.  Do you know how Google
12        Earth enterprise is priced?
13                A.   Google Earth Enterprise was priced
14        on a per customer basis based on what package
15        they purchased and the number of I believe
16        seats.
17                Q.   If my enterprise was authorizing
18        the use of enterprise for 500 individuals I
19        would pay more than if I were setting it up for
20        100?
21                A.   Typically, although each
22        individual customer relationship was its own
23        deal essentially, so potentially individual
24        salespeople negotiated different terms and
```

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 1        pricing.
 2                 Q.   Do you know why Earth View, why
 3        the Earth View functionality was introduced into
 4        the desktop version of the new Google ap?
 5                 A.   Yeah, we did that because we
 6        wanted to reach an even larger audience of users
 7        and because maps was a large group of users, we
 8        wanted to bring the same kind of capabilities to
 9        them.
10                 Q.   Was there a specific audience that
11        you had in mind?
12                 A.   We were primarily interested in
13        more casual users than the users of Google Earth
14        because it was an easier to access and lighter
15        weight application.  So in doing that, we
16        expected some of the users of Earth to migrate
17        to Maps and we were expecting an increase in the
18        overall usage of both products as a result.
19                 Q.   Did you attempt to put any dollar
20        value to that projected increase?
21                 A.   No, I did not.
22                 Q.   What about the Earth View
23        functionality in the Google Maps?
24                 A.   So the Earth View functionality is
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 1         just a mode within the larger Maps product.  And

 2         so Maps has its own property codes and its own

 3         way of surfacing aps, so they wouldn't

 4         necessarily be attributed to Earth View or any

 5         other specific feature or view.

 6              Q.   I'm handing you what's been marked

 7         as Exhibit 44.  Have you seen this document or

 8         portions of it before?

 9              A.   No, I have not.

10              Q.   Do you know what it is?

11              A.   Generally, yes.

12              Q.   What's your understanding?

13              A.   My understanding is it's proposal

14         for how to handle revenue that is not directly

15         attributable to the Geo business unit as part of

16         the P&L for Geo.

17              Q.   And is that revenue referred to as

18         derived revenue?

19              A.   It's a figure of speech.

20              Q.   The heading, Google runs on Geo,

21         and the first bullet point beneath that is IP

22         Geo added 100 million runrate to Adwords this

23         year, 37 percent of advertisers, 3 billion spent

24         in ads are Geo targeted.  Do you know what that
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669

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1        stands for?
2                A.    In general IP Geo is a technology
3        for estimating the location of a user based on
4        their IP address.
5                Q.    And do you know, do you have any
6        understanding of how IP Geo might add money to
7        the runrate for Adwords.
8                A.    My understanding is that by
9        allowing Geo spatial targeting for ads, it
10       increases the relevance of those ads and
11       therefore the value of those ads.
12               Q.    The bullet point second up from
13       the bottom states Google Earth has installed
14       more than ten percent of all Chrome SDA users,
15       saving nearly $100 million in referrals payments
16       per year.  Do you see that?
17               A.    It says 7DA, seven daily active
18       users.
19               Q.    Okay.  Did you see any similar
20       statistics around 2010?
21               A.    Yes.  So I was familiar with
22       numbers related to Earth installs of Chrome.
23               Q.    The referral payments that are
24       referenced in that bullet point, how do those
```

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 1        work?

 2                A.   So Google had an interest in

 3        having the Google column application installed,

 4        and so third parties who installed that

 5        application, perhaps as part of their own

 6        application installation flow, would get a

 7        referral fee for -- that could be attributed to

 8        their application for a successful installation

 9        of Google Chrome.

10                Q.   Can you turn to the page that ends

11        in 104 titled Geo Revenue Analysis.  What would

12        this $128 million forecast for 2010 for P & L

13        revenues with Maps and Earth include?

14                A.   So I'm not certain what that

15        includes, but I would assume it can include both

16        advertising revenue and licensing revenue for

17        Maps End earth products.

18                Q.   Would the 76 million forecast for

19        P&L revenue on Enterprise Geo be licensing

20        revenue for that product?

21                A.   I would assume that it would be

22        licensing revenue, but I don't know which

23        products might be under the Enterprise Geo

24        category versus the Maps and Earth.
```

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1                Q.   The 87 million forecast in 2010

2    for Earth Client, what derived revenues go into

3    that?

4                A.   That's a combination of revenue

5    from Chrome installs and potentially a small

6    amount of Toolbar installs.

7                Q.   I'm handing you what's been marked

8    as Exhibit 45.  Does this document relate to

9    Chrome installs off of Earth?

10               A.   No.

11               Q.   What does it relate to?

12               A.   This relates to information about

13   the post, to what we call a TGIF, which is a

14   weekly company level meeting.

15               Q.   The bottom statement, 123 million

16   installs plus 26 million Toolbar installs, do

17   you know what that refers to?

18               A.   Yes.

19               Q.   What?

20               A.   The 123 million installs is I

21   believe installs of Google Earth Client.  And

22   the 26 million Toolbar installs are installs of

23   Toolbar through the Google Earth install

24   process.
```

1   Q.   What's Toolbar?

2   A.   Toolbar is an older product that

3   was a browser extension that provided easy

4   access to Google products.

5   Q.   A couple of lines beneath that

6   there is a reference to It's way cool, increases

7   mind share, generate good will for Google, great

8   demonstration of our technological ability.

9   Great for recruiting. Do you see that? What's

10   mind share?

11   A.   Mind share is an overall general

12   expression for how much people pay attention to

13   and think about Google as a whole.

14   Q.   We talked about Chrome referrals

15   and Toolbar referrals out of Google Earth. Have

16   there been any other Google products that have

17   been referred to out of Earth?

18   A.   No.

19   Q.   I'm handing you what's been marked

20   as Exhibit 36. The page that I have directed

21   you to that ends in 288, most of that page

22   includes an E-mail from Brian McClendon; right?

23   A.   Correct.

24   Q.   And along about the bottom third

```
 1        of the page, there are thirty day unique visitor

 2        statistics quoted; correct?

 3                A.   Correct.

 4                Q.   And the number that's reported is

 5        27.5 million?

 6                A.   Correct.

 7                Q.   And the date of this E-mail is

 8        July 8th of 2006; correct?

 9                A.   Correct.

10                Q.   Also reported are minute

11        procession statistics and unique -- average

12        minutes per unique user; correct?

13                A.   Correct.

14                Q.   Are these statistics consistent

15        from what you recall from Google Earth from that

16        period of time?

17                A.   To the best of my knowledge, yes.

18                Q.   At that time did you regard Earth

19        as a successful product?

20                A.   Yes.

21                Q.   Is the 3D capability in Maps

22        important -- I'm sorry, is the 3D display

23        capability in Earth important?

24                A.   Yes, it's a core part of the Earth
```

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 1    experience.

 2              Q.   Are there any other products

 3    competitive with Google Earth that have the

 4    ability to display three-dimensional mapping

 5    data?

 6              A.   Not that I'm aware of.

 7              Q.   I'm handing you what's been marked

 8    as Exhibit 47.

 9              A.   Okay.

10              Q.   And this is a document that was

11    posted by Google on October 5th of 2011?

12              A.   Correct.

13              Q.   And the purpose of the posting was

14    to announce its billionth download of Google

15    Earth?

16              A.   That's correct.

17              Q.   Is that consistent with your

18    understanding of when the billionth download of

19    Google Earth occurred?

20              A.   Yes.

21              Q.   Do you know how many downloads

22    there have been today?

23              A.   The number is I believe over two

24    billion at this point, but I have to revisit the
```

1   dash to be certain. It may be -- actually maybe

2   it's 1.7 or something like that.

3   Q.   What benefits do you believe

4   Google Earth provides consumers?

5   A.   Google Earth is a very fun and

6   unique way to explore the world. I think

7   everyone has interest in what's happening in the

8   world, whether it's in their immediate

9   neighborhood or whether it's in distant places

10   that they have never visited. And Google Earth

11   is the best tool for people to be able to

12   virtually browse the globe.

13   Q.   What do you feel makes it the best

14   tool for that purpose?

15   A.   It's a combination of the

16   availability, that it's available across pretty

17   much any platform that a user may have

18   available. It's available in a wide number of

19   countries.

20   The performance, we're very

21   focused on performance and having a very smooth

22   interactive experience. It's easy to use. The

23   data, and the data that we have available is the

24   broadest set of data that can be available, and

 1   is fresh and accurate.

 2   Q.   I'm handing you what's been marked

 3   as Exhibit 48.

 4   A.   Okay.

 5   Q.   Turning to the third page which

 6   ends in Bates number 322, the heading there is

 7   key takeaways. Do you see that?

 8   A.   Yes.

 9   Q.   And the fourth box there is headed

10   unique features by platform. Do you see that?

11   A.   Yes.

12   Q.   And is Earth View identified as a

13   unique feature of Google Maps for desktop?

14   A.   Yes.

15   (End of videotape.)

16   MR. HAWES: Your Honor, we'd like

17   to offer into evidence the exhibits that were

18   identified during the deposition.

19   THE COURT: List them.

20   MR. HAWES: Plaintiff'S trial

21   exhibit 41 through 45. Plaintiff'S trial

22   exhibit 55. Plaintiff'S trial exhibit 99 and

23   Plaintiff'S trial exhibit 341.

24   THE COURT: Any objection?

```
 1                     MR. SNYDER:  No objections.

 2                     THE COURT:  Those exhibits are

 3         admitted.

 4                     MR. HAWES:  ACI would next call

 5         Mr. Mike Roszak, also by video deposition.  Mr.

 6         Roszak is a financial manager at Google.  He

 7         will testify about the financial information

 8         that Google tracks for the Geo business unit.

 9         This video is only five minutes.

10                     Your Honor, I apologize, we

11         evidently have -- because there were two

12         depositions of Mr. Birch on 30(b)(6) we actually

13         have a small piece of Mr. Birch before we get to

14         Mr. Roszak.

15                     THE COURT:  Oh, okay.

16                     MR. HAWES:  But Mr. Birch is still

17         a senior product manager.  This is a small

18         additional clip of his video.

19                     (Video playing.)

20              Q.   For the record, exhibit #151 is an

21         e-mail chain, again, it's at document number

22         Google 97601 to 602.  Subject check check could

23         you see that?

24              A.   I do.
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 1                    Q.   What do you understand to be meant

 2         by imputed revenue in that subject?

 3                    A.   So as we discussed earlier,

 4         imputed revenue is an accounting metric for

 5         representing value to the Geo organization that

 6         is not from direct sales or other direct sources

 7         of revenue.

 8                    Q.   Do you remember prior to October

 9         2010, do you remember revising any description

10         of imputed revenue for the Geo group?

11                    A.   I have been -- I have been

12         involved in helping to calculate Geo's proposal

13         for an imputed revenue number based on client

14         installs through Google Earth.

15                    Q.   And that was the toolbar and

16         Chrome installs we discussed earlier?

17                    A.   That is correct.

18                    Q.   And there's a discussion in the

19         second paragraph where he says some FA's have

20         successfully argued for imputed revenue and the

21         OCQPNL'sis of mobile and commerce of some very

22         aggressive claims on parts of that revenue, but

23         it is double counted.  Do you see that?

24                    A.   I do.
```

1   Q.   And in preparing this discussion

2   of imputed revenue, was Mr. McClenden acting as

3   a Google employee?

4   A.   Yes.

5   Q.   For the record exhibit 153 is an

6   e-mail chain with document number Google

7   AC-154010 through 011 and it is entitled Earth

8   Revenue, correct?

9   A.   Correct.

10   Q.   And it includes a chart titled

11   Revenue, paren, Weekly, paren. Do you see that?

12   A.   Yes, I do.

13   Q.   The top category is partner Google

14   Earth Geo codes. Do you see that?

15   A.   I do.

16   Q.   Could you describe for me how

17   Google would receive revenue for that category?

18   A.   So the Google Earth product

19   surfaces ads in different scenarios.

20   Q.   Uh-huh.

21   A.   And in doing so we take advantage

22   of the ads where ad words and ad sends products.

23   And so any revenue that would be generated from

24   those ads would basically would -- would pass

1   through the ads infrastructure and given that

2   it's a Google property, then any revenue

3   generated would be attributed to Google.

4   Q.   Exhibit #154 is marked with

5   document numbers Google AC-113835 through 836.

6   The methodology appears to be allocating revenue

7   to Enterprise. Is that your understanding of

8   that methodology?

9   A.   My understanding of this is a

10   proposal for having Geo imputed revenue from

11   sales that are -- would at this period of time

12   be attributed to the Enterprise organization,

13   but would also show up as -- or would ultimately

14   show up as imputed revenue in the Geo

15   organization.

16   MR. HAWES: Your Honor, for that

17   clip we would like to offer into evidence

18   Plaintiffs trial exhibit 95.

19   MR. SNYDER: No objection.

20   THE COURT: That exhibit is

21   admitted.

22   MR. HAWES: Thank you, Your Honor.

23   Now is this a good time to show the short Roszak

24   video.

```
 1                     THE COURT:  Why don't you show the

 2      short clip and we'll take our afternoon break.

 3                     MR. HAWES:  Sounds good.  We're

 4      now going to show the video of Mr. Roszak.

 5                     (Video playing.)

 6           Q.   Could you state your full name,

 7      please?

 8           A.   Mike Roszak.

 9           Q.   Do you work for Google?

10           A.   Yes.

11           Q.   In what position?

12           A.   Finance manager.

13           Q.   And in what facility are you

14      based?

15           A.   Mountain View.

16           Q.   Could you describe what you do for

17      the company?

18           A.   I'm in the financial planning and

19      analysis team.

20           Q.   Okay.  How does Google determine

21      the profitability then for the Geo group as a

22      whole?

23           A.   That's kind of a broad question.

24           Q.   I know it's intended that way?
```

```
 1              A.   We -- we define Geo revenue and

 2    Geo expenses and subtract those to get the

 3    profitability.

 4              Q.   What do you include within the Geo

 5    revenue?

 6              A.   It would include the advertising

 7    on Maps products, the Maps For Work revenue, are

 8    the two main areas.

 9              Q.   And Maps For Work revenue includes

10    licenses and Pro and Enterprise?

11              A.   Yes.

12              Q.   Are there any other contributions

13    to revenue that you're aware of?

14              A.   There might be a couple other

15    things, but those are the two main ones that we

16    report.

17              Q.   And to the extent there is

18    anything else, the contribution is minor?

19              A.   Yeah.  It depends how we define

20    minor, but we lump everything else into other.

21              Q.   What sort of expenses are

22    subtracted out to determine the profitability of

23    Google's Geo business?

24              A.   It's a variety of expenses, but
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 1        would include the engineering effort, the sales

 2        and marketing efforts, the data center costs,

 3        amongst others.

 4                 Q.   One other cost that would be

 5        subtracted out would be the cost of obtaining

 6        geographic data?

 7                 A.   To the extent we license Geo data,

 8        yes.

 9                 Q.   Are there any other significant

10        costs associated with the maintenance of

11        Google's Geo business?

12                 A.   There could be other lines on

13        there, but those are the main ones.

14                 Q.   I am sure I know the answer to

15        this already, but does Google track any costs

16        specifically with respect to Google Earth Pro?

17                 A.   No.

18                 Q.   With respect to Google Earth

19        Enterprise?

20                 A.   No.

21                 Q.   With respect to free Google -- to

22        Google Earth Free?

23                 A.   Specific to it, no.

24                 Q.   No, okay.  Are you aware of Google
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 1        having attempted to calculate the profitability

 2        of new Google Maps?

 3                A.    No.

 4                Q.    To the extent that's done, it's

 5        done within the context of the Geo business as a

 6        whole?

 7                A.    Yes.

 8                Q.    Does Google have any target profit

 9        margins for its Geo business?

10                A.    It would depend how you define

11        target, but we have an annual plan.

12                Q.    Do these annual plans set forth a

13        profit margin that the Geo business would like

14        to see achieved?

15                A.    Yes.

16                Q.    And that's done as a general

17        matter?

18                A.    Yes.

19                Q.    Okay.  Have you -- are you aware

20        of any effort by Google to track any nonmonetary

21        benefits it derives from Google Earth, such as

22        enhancement of the Google brand?

23                A.    Enhancement of the Google brand,

24        no.
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1                    Q.   Okay.  Have you seen any analyses

2      of how Google Earth Free may increase revenue

3      realized by Google by increasing clicks per

4      cost?

5                    A.   No.

6                    Q.   Do you have any understanding as

7      to why Google makes these products available for

8      free?

9                    A.   No.  I don't speculate on that

10     strategy behind that.

11                   Q.   There are others within the

12     company that are responsible for those

13     decisions?

14                   A.   Yes.

15                   Q.   Do you have any general

16     understanding as to how Google goes about making

17     money?

18                   A.   Yes, I have a general

19     understanding.

20                   Q.   What's your general understanding?

21                   A.   My general understanding is that

22     Google makes the majority of its revenue through

23     advertising.

24                   Q.   Do you have any understanding as
```

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 1        to how Google makes itself an attractive

 2        platform for advertising?

 3                 A.   In general terms.

 4                 Q.   Okay.  What's your general

 5        understanding?

 6                 A.   It tries to create products that I

 7        would suspect benefit users and trying to create

 8        good product, I think.

 9                 Q.   Is the idea being to encourage

10        users to spend more time interacting with Google

11        products?

12                 A.   Not necessarily.

13                 MR. HAWES:  And Your Honor, there

14        are no exhibits associated with that deposition,

15        so we could take a break now unless there's

16        anything else.

17                 THE COURT:  Why don't we take a

18        break until 3:30 and the jury should of course

19        not discuss the case during the break.

20                 (Jury exits.)

21                 THE COURT:  Be seated, please.  So

22        when we come back, we can discuss the revision

23        portions of the final jury instruction.  This is

24        very tentative.  This is not close to being done
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 1        to what I think is useful for us to discuss it.

 2                    (Short recess.)

 3                    THE COURT:  Be seated, please.

 4                    I gave you this tentative draft of

 5        a portion of the damages instruction.  We don't

 6        have to discuss that now.  We can discuss it at

 7        the end of the day, we can discuss it tomorrow

 8        morning.  The only reason I have given it to you

 9        now is because I know your damages expert on

10        cross-examination is coming up and I thought it

11        was fair to let you know what I was thinking of

12        in terms of the parameters of the instruction.

13                    What's your pleasure, do you want

14        to discuss it now or do you want to wait?

15                    MR. HAWES:  Thank you, Your Honor.

16        We have reviewed it.  My guess is there will be

17        some -- we will propose a few modifications, but

18        I think it will be based on how the evidence

19        comes in.  I don't see any need to go through it

20        right now.

21                    MR. SNYDER:  I agree with that,

22        Your Honor.  There is -- depending on how the

23        evidence comes in and how Mr. Nawrocki has

24        previously disclosed his methodology, I think
```

1   the last portion of it, the last short paragraph

2   about the royalty rate that might be applied to

3   these revenues would have to be addressed. But

4   I don't know that we need to do that now. And

5   other than that, I think that it's fine.

6   THE COURT: Why don't we postpone

7   further discussion of that and just bring the

8   jury back in.

9   Thank you.

10   (Jury entering the courtroom at

11   3:32 p.m.)

12   THE COURT: Be seated. And who is

13   the next witness?

14   MR. HAWES: Your Honor, ACI next

15   calls Mr. Gopal Shah. Mr. Shah is the product

16   manager, is a product manager for Google Earth

17   and he will testify about marking studies

18   conducted by Google. The video is about seven

19   minutes.

20   (Videotape testimony:)

21   Q.   Could you please state your full

22   name for the record.

23   A.   Gopel Narendra Shah.

24   Q.   And you are employed by Google?

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 1                A.   I am.

 2                Q.   What's your current title?

 3                A.   Acting product manager for Google

 4      Earth.

 5                Q.   Have you ever heard the term

 6      activation at Google?

 7                A.   I have.

 8                Q.   What does activation mean to you

 9      with respect to using it as Google?

10                A.   Downloads.

11                Q.   And I'm trying to figure out why

12      Google was giving away Google Earth for free, I

13      was seeing if you had any discussions of why

14      Google gave away Google Earth for free?

15                A.   Not that I can remember.

16                Q.   Okay.  Do you remember in your

17      time as PMM ever discussing derived revenue?

18                A.   Yeah, what do you mean by "derived

19      revenue"?

20                Q.   Well, it's a term I have seen in

21      some documents.  I'm just asking, have you ever

22      heard that term in your time as Google -- at

23      Google.

24                A.   No.
```

```
 1                    Q.    What products are you aware of

 2        that Google offers for free?

 3                    A.    What products am I aware that

 4        Google offers for free?  Google Search, Gmail,

 5        Google Maps.  What else?  Chrome.  Google Apps,

 6        Drive.  I'm sure there are others not coming to

 7        mind, but those are the ones that come to mind.

 8                    Q.    Would you include Google Earth on

 9        that list?

10                    A.    Yes.

11                    Q.    With regard to the products you

12        just mentioned, have you ever discussed why

13        those are offered for free by Google?

14                    A.    I don't recall any discussions

15        between me and someone else about why they're

16        free.

17                    Q.    Have you ever seen a presentation

18        about why any of those products are offered for

19        free?

20                    A.    Not internally, no.

21                    Q.    So Exhibit Number 11 is dated

22        February 26th, 2015.

23                    Do you see that?

24                    A.    That's correct.  Yep.
```

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 1                Q.   And I believe you said that you're

 2      familiar with this document?

 3                A.   I am.

 4                Q.   Who authored this document?

 5                A.   I did, along with Sean Askay.

 6                Q.   Whose idea was it to create this

 7      document?

 8                A.   I don't actually know.

 9                Q.   Why did you decide to work on this

10      document?

11                A.   I was asked to.

12                Q.   Who asked you to?

13                A.   Sean.

14                Q.   Could you turn with me on page

15      981.

16                A.   Sure.

17                Q.   That slide states, "Maps plus

18      Earth have the two of five most favored Google

19      brands."  Do you see that?

20                A.   Yes.

21                Q.   Could you explain what that meant?

22                A.   Yeah.  Well, that's a typo. It

23      should say, have two of the five most Google

24      favored brands.  There was a study, it was a
```

1   brand guide study, like the one we looked at

2   earlier where they assessed a group of -- and

3   this is -- we talked about earlier -- of about

4   20 products. And they asked users what their

5   impression was. I'm not entirely sure how the

6   question was phrased, but the users' response

7   was other very positive, somewhat positive or

8   negative, or grouped into those buckets, I

9   should say. And I -- and they went through the

10   list of products and asked, you know, the

11   participants of the survey to rank -- or to give

12   their feeling on each of these and then it was

13   ranked in this chart.

14   Q.   And do you agree that Maps and

15   Earth -- so correcting for the spell -- or for

16   the words, do you agree that Maps and Earth have

17   two of the most -- of the five most favored

18   Google brands?

19   A.   My personal opinion doesn't

20   matter, but what -- at the time that this study

21   was taken, that would be the conclusion I would

22   make, yes.

23   Q.   Have you seen any other studies

24   that would cause you to doubt that in any other

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 1        time frames?

 2                A.   No.

 3                Q.   The title of this slide is good

 4        for the brand.  Do you see that?

 5                A.   I do.

 6                Q.   What is good for the brand?

 7                A.   That Google Maps and Earth have

 8        favorable brands is for the brand at large.

 9                Q.   And what is the brand at large

10        that's being referred to there?

11                A.   Google.

12                Q.   Turning two pages ahead to

13        slide -- to page number 984 in exhibit 11.

14                A.   Yep.

15                Q.   You'll see a slide titled by the

16        numbers.  Do you see that?

17                A.   I do.

18                Q.   And it says massive activations.

19        We discussed earlier that activations can be

20        used to mean downloads.  That what it means

21        here?

22                A.   It does.

23                Q.   And am I correct that at that time

24        there were 1.9 billion downloads?
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1                    A.    That's correct.

2                    Q.    Has that crossed two billion yet?

3                    A.    It has.

4                    Q.    Did you prepare this slide or was

5      it Sean?

6                    A.    It was Sean.

7                    Q.    The second point here is strong

8      engagement.  In -- and then it says paren,

9      active -- average session length, paren.  Do you

10     see that?

11                   A.    Yeah.  Right.

12                   Q.    Do you agree that the number of

13     minutes shown here indicates strong engagement

14     with Google Earth?

15                   A.    Yes.

16                   Q.    I'll ask the court reporter to

17     mark as Exhibit 15 a document bearing numbers

18     Goog AC-60679 through 759?

19                   Q.    Are you familiar with this

20     document?

21                   A.    I have seen this document.

22                   Q.    Looking at the next slide, number

23     744.

24                   A.    Uh-huh.
```

```
 1              Q.   Do you agree that the primary

 2    association of users with Google Earth is for a

 3    virtual journey to any location in the world?

 4              A.   Yeah, I don't -- I mean, again,

 5    agree, disagree, I -- according to this, I would

 6    come to that conclusion.  According to this

 7    chart, I would come to the same conclusion.

 8              Q.   So the only data you're -- you're

 9    aware of for the primary association for Google

10    Earth is with the most associated aspect of

11    being a virtual journey to any location in the

12    world?

13              A.   That's correct.

14              MR. HAWES:  And Your Honor, we

15    would offer into evidence Plaintiff's trial

16    exhibit 76 and Plaintiff's trial exhibit 350

17    based on the deposition testimony.

18              MR. SNYDER:  No objections, Your

19    Honor.

20              THE COURT:  Those objections are

21    admitted.

22              MR. HAWES:  And Ms. Alfaro will

23    present our next witness.

24              MS. ALFARO:  Good afternoon.  My
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1   name is Natalie Alfaro and I represent the

2   Plaintiffs, ACI. ACI calls as it's next witness

3   Mr. Andreas Wiek. Mr. Wiek may need the

4   assistance of our interpreter, Ms. Weisner.

5   ANDREAS WIEK,

6   the deponent herein, having first

7   been duly sworn on oath, was

8   examined and testified as follows:

9   BY MS. ALFARO:

10   Q.   Good afternoon, Mr. Wiek?

11   A.   Good afternoon.

12   Q.   Will you be testifying in English

13   or German today?

14   A.   I want to try it in English, but

15   I'm not so good in English. I understand a

16   little bit more than I speak and I hope that it

17   will be a little bit easier for us will be if I

18   start with English. And I hope I have the

19   chance to end in English.

20   Q.   Okay. That will be fine. The

21   interpreter Ms. Weisner will be here, so if you

22   need her help, please don't be afraid to ask.

23   If you don't understand my questions or you

24   don't understand the questions that Google's

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 1        attorney poses to you, please don't be afraid to

 2        ask for help, okay?

 3                A.   Okay.  Thanks a lot.

 4                Q.   Is there anything that I can do as

 5        the one asking the questions to make my

 6        questions easier to understand?

 7                A.   Yes, please.  Speak slow and clear

 8        for me.

 9                Q.   Okay.  I can do that.  For which

10        company do you currently work.

11                A.   I work for Art+Com AG.

12                Q.   What's your current title?

13                A.   CEO.

14                Q.   How long have you been with

15        Art+Com AG?

16                A.   I worked there a little bit more

17        than 15 years.

18                Q.   Can you explain to the jury the

19        different -- let's go with the relationship, the

20        relationship between Art+Com AG, the company

21        that you work for, and ACI, the Plaintiff in

22        this case?

23                A.   The ACI is --

24                     THE COURT:  The witness should
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 1        speak into the microphone.

 2                    THE WITNESS:  More.  Yeah.  Sorry

 3        about that.  Better.  Okay.  The ACI is a spin

 4        off of Art+Com.

 5     BY MS. ALFARO:

 6                Q.   Which company between Art+Com and

 7        ACI developed the patent that's at issue in this

 8        case?

 9                A.   Art+Com developed the patent.

10                Q.   Mr. Wiek, what are your duties as

11        CEO of Art+Com?

12                A.   I have to manage our staff, to

13        guide the staff and the hardest thing that I

14        have to go outside and to look for the new

15        projects to the clients.

16                Q.   Will you briefly summarize the

17        business of Art+Com for the jury?

18                A.   We have a lot of projects in it.

19        We work for international, national museum, we

20        work for big companies, car companies, German

21        car companies, you know them I hope, BMW,

22        Volkswagen, Deimler and other one, Dutch Telecom

23        and we try to get big projects for them and make

24        a whole exhibition?
```

1   Q.   Can you give the jury an example

2   of a type of project that Art+Com has worked on?

3   A.   I think the best project in the

4   last years was a project with BMW. BMW build up

5   a new museum in Munich and this was a build up

6   in four sections. One of the sections was the

7   process, we have to show the process, the design

8   process, how will you build up the car. Our

9   ability is to invent new formats, we have to

10   develop new formats and so we start with a

11   complete new format in one room. Think you

12   would -- you have to think a new figure, a new

13   car, a new product. And at the beginning you

14   have no idea. So in this room hanging up 720

15   balls from the ceiling and one ceiling we run

16   from our software, each ceiling, each ball

17   hanging up. And at the beginning the balls are

18   indifferent in the room and come up after time

19   to a car. That was idea that you have to think

20   about, what is a car, how can be a car and then

21   you come up to the car. It's maybe not so easy

22   to explain it in my English, so I think it's

23   better I bring with me a short video, we can see

24   if you want.

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 1                    Q.   Yes.  Go ahead and play it, Mr.

 2       Lodge?

 3                    A.   So now you see these balls, all

 4       these balls, each ball run through our software.

 5       We develop a new software and at the beginning

 6       you not know what you want and then it come up

 7       this car.  This is what I have to try to explain

 8       to you.

 9                    Q.   Very good.  Thank you Mr. Wiek.  I

10       would like to transition now to Art+Com's

11       discussions with Google back in 2006.  Do you

12       recall those discussions?

13                    A.   Yes.

14                    Q.   Were you personally involved in

15       those discussions with Google?

16                    A.   Yes, I was involved, yes.

17                    Q.   What was Art+Com hoping to

18       accomplish by starting these discussions with

19       Google in 2006?

20                    A.   Can you repeat it?

21                    Q.   Let me try again.

22                    What was Art+Com hoping to

23       accomplish by starting the discussions with

24       Google in 2006?
```

1   A.   We want to make business with

2   Google. We have in Berlin our office. And we

3   have there now ninety people, earlier a little

4   bit less. And want to make business with Google

5   in Germany, in Europe, in Berlin.

6   Now, you know, Berlin is a big

7   city with a lot of startups, more than in

8   London, now, not a little bit earlier. But to

9   think about to make projects with Google in 3D,

10   in virtual reality and augmented reality in all

11   the cases would be the best, the greatest thing

12   what we want.

13   Q.   Did you meet, did you personally

14   meet with anyone from Google in 2006?

15   A.   Yes. I met Michael T. Jones in

16   April. And John Hanke a little bit later in

17   June.

18   Q.   Let's talk about the meeting with

19   Mr. Jones in April of 2006. What did you

20   discuss with Mr. Jones when you met with him in

21   Berlin?

22   A.   Michael Jones and Pavel Mayer were

23   a little bit -- they know him a long time. And

24   they discuss a lot of things between the

1   possibilities, Google opportunities to the

2   corporation, et cetera.

3   Ten years ago, believe me, my

4   English was very bad, and my discussion with

5   Michael was not so strong. But I went with him

6   to the dinner. It was nice dinner and we talked

7   a little bit about business and business

8   opportunities.

9   Q.   What kind of business

10   opportunities did you discuss with Mr. Jones?

11   A.   Projects. We make a lot of

12   projects that we want to make more projects. We

13   want to make more projects with Google in

14   Berlin. And up to this discussion, Michael say

15   to us, oh, Art+Com is so cool that I think we

16   have to have shares in Art+Com. They want to

17   buy us. After this evening, we say oh, Jesus,

18   we have maybe no company or do we have a

19   company. And we discussed to have shares from

20   Google to us and maybe to make a lot of

21   projects, that was the discussion.

22   Q.   Was Art+Com's patent part of those

23   discussions?

24   A.   Yes. The patent, the patent was

1   part of the discussion, but not me, I'm not

2   technical guy, I cannot discuss in English a

3   patent, it's not my way. Ten years ago, no

4   chance.

5   Q.   Did you and Mr. Jones talk about

6   the Art+Com patent at all in April of 2006?

7   A.   Me?

8   Q.   Yes, you.

9   A.   No.   Maybe in the evening a little

10   bit, but not about the patent, no.

11   Q.   Who did Mr. Jones speak with about

12   the patent?

13   A.   Pavel Mayer discuss a lot of this

14   patent with Michael, and came up to me and say

15   Michael said that he has, or Google has their

16   own method for this running system, and we

17   have -- nice to have patent, we have perfect

18   patent, maybe, but he has own method.

19   Q.   Did you believe Mr. Pavel Mayer

20   when he told you that?

21   A.   Pavel Mayer trust Michael very

22   much. And I trust Pavel much more than very

23   much, yes.

24   Q.   Mr. Wiek, I would like you to look

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 1        at your notebook.  There is a document in there,

 2        PTX 206.  Can you take a look at that?  What is

 3        this document?

 4                A.   This is the document I wrote to

 5        Michael.

 6                Q.   And the second paragraph, second

 7        sentence I guess, "As a quick follow-up to

 8        Pavel's e-mail, I would like to summarize the

 9        business aspects of our discussions in more

10        detail."

11                     Do you see that?

12                A.   Yes, I see that.

13                Q.   Let's turn to the second page of

14        that e-mail, the attachment.  Turn to the back

15        of your document.

16                A.   Yeah, I did it.

17                Q.   The first sentence on there, it

18        says, "It is our understanding from our

19        discussions in Berlin, April 24th to the 25th,

20        that there are basically three viable options."

21                     Do you see that?

22                A.   Yes, I see that.

23                Q.   What did you mean by three viable

24        options?
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1   A.   The three points describe the

2   whole package we discussed together with

3   Michael. I think option that's not the right

4   word, maybe the translation or whatever. These

5   three options, or these three points is better.

6   The package deal, we want to think about maybe

7   to make business and to make maybe think about

8   the patent.

9   Q.   Can you briefly summarize these

10   three points up here for the jury?

11   A.   The first point you see it, it's a

12   patent discussion. It was not my discussion, it

13   was more Pavel. And we heard from Google that

14   they never need our patent that time, so it was

15   maybe just nice to have patent, the discussion

16   was just a little bit.

17   The next one was to make

18   activities, projects, corporation maybe, and our

19   project we run, the thought was I told you to

20   buy maybe stakes, shares, complete, whatever.

21   Q.   Does this e-mail summarize the

22   business aspects of the discussions that you and

23   Mr. Mayer had with Mr. Jones in April of 2006?

24   A.   Yes. We discussed the business

1   package deal, yes.

2   Q.   At this point in time in 2006, was

3   Art+Com interested in licensing the patent to

4   Google without a bigger business deal?

5   A.   No. I was only interested in

6   corporation because I told you, Berlin, it's a

7   great city. It's my company and I want to

8   develop this company. I want to have more

9   business. Just to think about, to discuss the

10   license for patent, it's not -- it was not my

11   deal, no.

12   Q.   In 2006, who would have been the

13   person at Art+Com in charge of making the final

14   decision with respect to a business deal with

15   Google?

16   A.   Me, just me.

17   Q.   And in your mind, would Art+Com

18   have been open to licensing the patent to Google

19   without a bigger business deal that involved

20   joint projects between the two companies?

21   A.   No, never.

22   Q.   Why not?

23   A.   It's less to have to think and to

24   discuss just the patent. I want to have a big

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 1        project.  If you think that Google offered 30
 2        million, 30 million, for me it's great.  It's
 3        great number.  And we discussed in addition
 4        maybe projects.
 5                    Then I can maybe for the next,
 6        five, six, eight, ten years, make big business
 7        with big player, now with the biggest player of
 8        the world.  That means I double my business.
 9        And that may be in Europe at my office in
10        Berlin.  It was a big chance.  It was my chance.
11             Q.   At this time in 2006, did you
12        think that Google also had an interest in maybe
13        working with Art+Com in Germany?
14             A.   Absolutely.
15             Q.   And why was that?
16             A.   Michael in June and April, they
17        were twice in Berlin.  They travel to Berlin.
18        We give him e-mail and he come very close to the
19        e-mail, very fast to Berlin.  He has -- I think
20        he wants to work together with us, yes.
21             Q.   Mr. Wiek, in 2006, were you aware
22        of any issues that Google had raised with
23        respect to the validity of the patent?
24             A.   No.
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 1              Q.   Were you ever personally involved

 2    in any discussions with Google regarding the

 3    technical aspects of the patent?

 4              A.   No.  I explained it a little bit

 5    before, it was not possible for me to discuss it

 6    in English and in technical, I am just

 7    businessman, and technical is not my favorite.

 8    Sorry, it's my thing.

 9              Q.   How long did the discussions with

10    Google last in 2006?

11              A.   About one year.  At the end of the

12    year, the discussion was ended.

13              Q.   Do you know why the discussions

14    ended?

15              A.   I think it's hard to say, but I

16    think the authority, the level for Michael was

17    not so high I thought, so maybe he go back and

18    say no, I cannot sign such a deal.  I don't

19    know.  And the authority was not so high.  He

20    wants, maybe, to work together with us, or buy

21    us, and then the discussion maybe at Google was

22    not so strong.  He gave then these letters and

23    things up to the attorney to Google in the legal

24    department something like that, and they have no
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 1        interest in us.

 2                Q.   Mr. Wiek, what is your

 3     understanding as to why Art+Com filed the first

 4     reissue application with the US-PTO after the

 5     discussions with Google in 2006?

 6                A.   Pavel Mayer came to me and say --

 7     Pavel is great guy, he has a lot of ideas and is

 8     technical perfect, I cannot explain it enough.

 9     And he come to me and say if he make a reissue,

10     then we have the chance that we get even a

11     better patent.

12                   MS. ALFARO:   Thank you, Mr. Wiek.

13                   Pass the witness, Your Honor.

14                   MS. SIMMONS:   Your Honor, may I

15     approach the witness?

16                   THE COURT:   Yes.

17                   MS. SIMMONS:   May I proceed, Your

18     Honor?

19                   THE COURT:   Yes.

20                   CROSS-EXAMINATION

21     BY MS. SIMMONS:

22                Q.   Good afternoon, Mr. Wiek.

23                A.   Good afternoon.

24                Q.   My name is Luann Simmons and I'm
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 1        with the team that's representing Google here

 2        today.  And I'm just going to have a few

 3        follow-up questions for you regarding your

 4        testimony.  Okay?

 5                 A.   Okay.  Please slow.

 6                 Q.   And I have a tendency to talk too

 7        fast, so I'm going to try very hard to stay

 8        slow.

 9                 A.   Thank you.

10                 Q.   I would like to actually turn

11        right back to the e-mail that you were just

12        discussing.  Mr. Ang, if you could bring up

13        Plaintiff's Exhibit 206.  And let's just make

14        sure the jury noted that sometimes we're leaving

15        these on the screen a little small and it's hard

16        to read.

17                      This is an e-mail from you to

18        Mr. Jones at Google; is that right?

19                 A.   That's right, yes.

20                 Q.   And this is from May of 2006;

21        correct?

22                 A.   Yes.

23                 Q.   And I believe you testified and it

24        says in the e-mail on your direct that this was
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1        an e-mail where you are summarizing the

2        discussions that you had had with Mr. Jones;

3        correct?

4                    A.   Correct.

5                    Q.   If we could turn to the second

6        page, Mr. Ang.

7                         And these are the bullet points

8        that you were just discussing just a few minutes

9        ago; correct?

10                   A.   Yes.

11                   Q.   You list -- you indicated the

12       first sentence there of your e-mail that these

13       are the three viable options; correct?

14                   A.   Yes.  But I told you that's not

15       option correct, but, yes.

16                   Q.   Understood.  Understood.  In

17       addition, though, to identifying them as three

18       viable options, you have listed out three

19       separate bullet points in the e-mail blow that;

20       correct?

21                   A.   Yes.

22                   Q.   And one of those bullets is

23       acquisition, the first bullet is acquisition of

24       the patent by Google; correct?
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1              A.   Yes, correct.

2              Q.   And the second bullet if we could

3      highlight that one is actually clearly different

4      from the first, it's an alternative, it says

5      acquisition of the patent by Google in addition

6      to some mutual activities; correct?

7              A.   That's not correct, no.

8              Q.   That's just what it says?

9              A.   Sorry about it, I told you, no, we

10     have projects around and it could be very

11     interesting too make more projects about or

12     around or whatever this patent, it's an

13     addition, it's not the same, no.

14             Q.   Understood.  Understood.  So the

15     first option that you were communicating to

16     Google here is Google, you could buy the patent;

17     correct?

18             A.   If they make the package deal,

19     yes, that's correct.

20             Q.   It doesn't say that, though, in

21     your first bullet, does it, Mr. Wiek?

22             A.   It's a meaning of this

23     summarizing.

24             Q.   Well, the second bullet, though,
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1   is where you said acquisition of the patent in

2   addition to some activities; correct?

3   A.   In addition we want to make

4   projects, yes, correct.

5   Q.   That's what's reflected in the

6   second bullet; correct?

7   A.   The projects, yes.

8   Q.   And in connection with the first

9   bullet, the option for Google to buy Art+Com

10   patent, Art+Com offered $10 million euro for

11   that option; correct? I said $10 million, ten

12   million euros; correct?

13   A.   Yes, please, it's one of the

14   option, yes. Think about Michael wants to buy

15   the company, and we were discussed other things.

16   One of them is to buy the patent, yes.

17   Q.   And Art+Com was willing to sell

18   the patent to Google at this time for ten

19   million euro?

20   A.   If they make the package deal with

21   us and the business with us, then yes.

22   Q.   I'm referring to the bullet that

23   you listed here, which is just for acquisition

24   of the patent. You said the price point would

1   be 10 million euros. That's what you said to

2   Google in 2006, right?

3   A.   You think about if they make maybe

4   the shared deal with us, business project with

5   us and 10 million for the patent, then we can

6   maybe develop new product together, yes, why

7   not.

8   Q.   Google didn't accept that offer to

9   buy the patent for 10 million euros, correct?

10   A.   They didn't accept anything,

11   nothing, yes.

12   Q.   I believe you testified that

13   Google and ACI or Art+Com at the time, the

14   communications in 2006 ended around the end of

15   the year; is that right?

16   A.   That's right, yes.

17   Q.   And Google and ACI had further

18   communications in 2010, though, isn't that

19   right?

20   A.   Yes.

21   Q.   The parties weren't, again weren't

22   able to reach a deal in 2010; is that right?

23   A.   Yes.

24   Q.   And so ACI filed this lawsuit

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 1        against Google in 2014; is that right?

 2                A.   Can you repeat those, please?

 3                Q.   Sure.  That was a little fast too.

 4        So Google -- I'm sorry, ACI sued Google for this

 5        lawsuit in 2014, right?

 6                A.   Yes.

 7                Q.   ACI did not perform an analysis of

 8        Google products, including Google Earth before

 9        it filed this lawsuit, correct?

10                A.   No, it's not in my knowledge.  I

11        think we discussed our patent again in 2010.

12                Q.   Right.  Understood.  And the

13        parties weren't able to reach a deal in 2010,

14        though, right?

15                A.   2010 we discussed very optimistic,

16        the new corporation, yes.

17                Q.   Understood, but sadly no deal was

18        made?

19                A.   There was no deal, no.  You're

20        right, yes.

21                Q.   And so ACI sued Google in 2014,

22        right?

23                A.   Yes.

24                Q.   But ACI did not perform a
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 1        technical analysis of Google Earth before it

 2        filed its lawsuit in 2014, correct?

 3                A.   It's not in my knowledge.  I am

 4        not the CEO from ACI.

 5                Q.   Understood, but you recall that

 6        your deposition was taken in this case last year

 7        in Germany?

 8                A.   Yes.  In the American embassy,

 9        yes.

10                Q.   Right.  And there was a court

11        reporter present when you had your deposition

12        taken?

13                A.   Yeah.

14                Q.   Much like the court reporter we

15        have here today, right?

16                A.   Yes.

17                Q.   And you were placed under oath for

18        that deposition, correct?

19                A.   Yes.

20                Q.   There's a -- in your binder that I

21        gave you, your transcript is in there, and I

22        think it says deposition transcript on it.

23                A.   What do you mean, in Dutch?

24                Q.   Yes, sir.
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 1                    A.    And then --

 2                    Q.    I believe it just says deposition

 3        transcript.  Yes, sir.  I believe it is the last

 4        tab.

 5                    A.    Last one.

 6                    Q.    Yes, sir.  Deposition transcript.

 7        If you could turn to Page 20 of your deposition

 8        and I'll give you a chance to take a look.  I'm

 9        looking, focused on page 20, lines 12 through

10        17.

11                    A.    Page 20, line 12?

12                    Q.    12 through 17, yes, sir.

13                    A.    Yeah.  Yes, I see it.

14                    Q.    My understanding from your

15        testimony and we can read it if that's helpful,

16        you testified previously that Art+Com did not

17        perform an analysis of Google Earth before

18        filing the lawsuit, correct?

19                    A.    No, that's not correct.  You speak

20        about the year 2006 and in 2006 you are right.

21                    Q.    It is your --

22                    A.    We here, here is the year we speak

23        about, the year 2006 and in 2006 we make no

24        analysis.
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 1                    Q.   But the question -- and I'll go

 2      ahead and read it, was --

 3                    MS. SIMMONS:  Your Honor, may I

 4      read the testimony?

 5                    THE COURT:  Yes.

 6   BY MS. SIMMONS:

 7                    Q.   Did Art+Com AG perform any

 8      analysis on Google products prior to figure this

 9      lawsuit?  And your answer was no.  Isn't that

10      right?

11                    A.   This answers now yes.  And before

12      you see we discussed the years before, yeah.

13                    Q.   Right.

14                    A.   Okay.  Maybe the next question.  I

15      cannot understand this.  Yeah.

16                    Q.   You understood my question?

17                    A.   Ask the next question, please.

18                    Q.   Understood.  I just wanted to ask

19      you a quick question about the demonstration

20      that you showed of the kinetics sculpture.  You

21      remember you showed --

22                    A.   Yeah, yeah, yeah.

23                    Q.   That sculpture is not covered by

24      the patent that's at issue in this case, right?
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 1                    A.   Nothing to do with that, no.

 2                    Q.   Your testimony didn't relate to

 3         what's covered by the patent, isn't that right?

 4                    A.   Yes.

 5                    Q.   And your testimony doesn't relate

 6         to how Google Earth works, right?

 7                    A.   I am just a businessman, yes.

 8                    Q.   Mr. Wiek, you are part owner of

 9         the Plaintiff ACI, isn't that right?

10                    A.   Yes, that's right.

11                    Q.   You own 37 percent of ACI?

12                    A.   Yes.

13                    Q.   You are also a part owner of

14         Art+Com, correct?

15                    A.   Yes, correct.

16                    Q.   And you own 75 percent of Art+Com,

17         correct?

18                    A.   Yes, that's correct.

19                    MS. SIMMONS:  Thank you.  I don't

20         have any further questions.

21     BY MS. ALFARO:

22                    Q.   Thank you.  Just one quick

23         question on redirect.  Mr. Wiek, go back to page

24         20 in your deposition, please.
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1   A.   Yes.

2   Q.   Okay. I'd like to read a little

3   bit above where Ms. Simmons started. So the

4   question was asked do you know Michael Jones?

5   Do you see that?

6   A.   Yes.

7   Q.   And you answered yes. And then

8   the next question was, how do you know him? And

9   the answer is, I met him in 2006. Do you see

10   that?

11   A.   Yes.

12   Q.   And then the next question is when

13   did you -- where did you meet him and then the

14   answer is in Berlin. Do you see that?

15   A.   Yes.

16   Q.   And then the next question is did

17   Art+Com perform any analysis on Google products

18   prior to figure this lawsuit? And you answered

19   no. Do you see that?

20   A.   Yes.

21   Q.   Did you think that when this

22   question was asked at your deposition in 2015,

23   last year, did you think that the question was

24   referring to 2006?

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 1                    A.   Yes.

 2                    Q.   Okay.   Is Art+Com, the company

 3       that you work for, the Plaintiff in this case?

 4                    A.   Yes, I work at Art+Com.   No.

 5                    Q.   Who is the Plaintiff in this case?

 6                    A.   ACI.

 7                    Q.   Okay.   Thank you.

 8                    MS. ALFARO:   No further questions,

 9       Your Honor.   I'd like to offer into evidence

10       PTX-206.

11                    MS. SIMMONS:   No objection, Your

12       Honor.

13                    THE COURT:   Okay.   It's admitted

14       into evidence.   Again, jury has an opportunity

15       to ask questions of the witness.   Okay.   The

16       jury has no questions.   Thank you, Mr. Wiek.   I

17       assume this witness is subject to recall?

18                    MS. SIMMONS:   Yes, Your Honor.

19                    THE COURT:   You're excused for the

20       moment.   Thank you.

21                    MR. HAWES:   Your Honor, ACI calls

22       as its next witness by video deposition Mr. John

23       Hanke.   John Hanke was the vice president of

24       product management for the Geo business unit.
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 1        He was previously the CEO of Keyhole.  He will

 2        testify about Google's purchase of Keyhole and

 3        about Google's discussions with ACI in 2006.

 4        The video is about 20 minutes.

 5                  (Video playing.)

 6             Q.   Could you state your full name for

 7        the record?

 8             A.   John Vincent Hanke.

 9             Q.   Mr. Hanke, by whom are you

10        currently employed?

11             A.   Google.

12             Q.   What's your current title?

13             A.   Vice president of Niantic Labs.

14             Q.   What was your title before that?

15             A.   Vice president of product

16        management for Geo.

17             Q.   And when you were in that previous

18        role at that time, did you have within the

19        products you were managing Google Earth?

20             A.   That's correct.

21             Q.   We discussed earlier the

22        possibility that I would put the address of this

23        building in Google Earth.  Are you aware of any

24        metrics that measured the response to that type
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 1      of search?

 2               A.   Yes.

 3               Q.   And what metric would that be?

 4               A.    There would be a metric for the

 5      latency for Geo coding response and there would

 6      be a measurement of the time it took to fully

 7      load all of the data.

 8               Q.   Do you remember number of

 9      downloads ever being discussed in the management

10      presentation?

11               A.   Yes.

12               Q.   Do you consider that to be a

13      metric?

14               A.   Yes.

15               Q.   Do you remember how many downloads

16      there had been by the time you left the Geo

17      group?

18               A.    I remember when we crossed one

19      billion.

20               Q.   The -- was there a charge for

21      Google Earth in 2005?

22               A.   No.

23               Q.   So I could download Google Earth

24      from its very first version for free?
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 1                A.    Correct.

 2                Q.    Did you ever hear anyone in Google

 3     describe reasons for providing Google Earth for

 4     free?

 5                A.    This was discussion about

 6     rationale for making it free.

 7                Q.    What rationales do you remember

 8     being discussed?

 9                A.    That it would be good for users to

10     make this data and tool available to them.

11                Q.    Any other rationales you remember?

12                A.    No.

13                Q.    Do you remember of any rationales

14     as to why it would be good for Google to provide

15     Google Earth for free?

16                A.    That doing the thing that is good

17     for users would generally serve the interests of

18     the company in the long-term.

19                Q.    Prior to your employment with

20     Google, were you employed at a company called

21     Keyhole, Inc.?

22                A.    Yes.

23                Q.    And what was your role there?

24                A.    I was the CEO.
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 1               Q.   How long were you employed at

 2      Keyhole, Inc.?

 3               A.   About four years.

 4               Q.   Did Keyhole, Inc. develop a

 5      product called Earth Viewer?

 6               A.   It did.

 7               Q.   When did it first become available

 8      outside of Keyhole, Inc.?

 9               A.   2001.

10               Q.   Was Earth Viewer still a product

11      being offered at the time that Keyhole, Inc.,

12      merged with a Google subsidiary?

13               A.   Yes.

14               Q.   Did Earth Viewer continue to be

15      offered after the merger?

16               A.   Yes.

17               Q.   For how long after the merger was

18      Earth Viewer offered as a product?

19               A.   Until approximately the time that

20      we launched Google Earth.

21               Q.   And if I remember right, that was

22      June 2005?

23               A.   Correct.

24               Q.   Did there come a time when you had
```

```
 1        communications with Google as CEO of Keyhole?

 2                  A.   Yes.

 3                  Q.   How did those communications come

 4        about?

 5                  A.   They -- well, I got a phone call

 6        from a person in business development that said

 7        they wanted to have a meeting with us.

 8                  Q.   Was there anyone -- well, were you

 9        at the meeting?

10                  A.   I was.

11                  Q.   Where was the meeting held?

12                  A.   On the Google campus.

13                  Q.   Did you display your software

14        during that meeting?

15                  A.   I believe so.

16                  Q.   Did you have discussions with

17        anyone at Keyhole about whether being acquired

18        by Google would be good for Keyhole?

19                  A.   I did.

20                  Q.   What arguments do you remember

21        being made in those discussions in favor of the

22        Google offer?

23                  A.   The one argument that I remember

24        is that Google had substantial investment and
```

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1   data centers and expertise in infrastructure

2   that could reach large numbers of people, and

3   that a partnership with Google would enable us

4   to, you know, have the technical foundation to

5   deliver the product to a large number of people

6   and -- yeah.

7   I mean, there are cases where

8   local search data can be triggered as part of a

9   web search in the case that we called Local

10   Universal.

11   Q.   Can you describe that for me?

12   A.   Whenever a web search was

13   determined to be primarily about local matters,

14   it could draw upon a separate repository of the

15   local information to populate those results.

16   That configuration and product changed a lot

17   over time and I don't know if it still works

18   that way.

19   Q.   And I know it changed over time.

20   At some points in time was that separate

21   repository a repository that was part of the

22   local search product that was in Geo?

23   So is it fair to say that there

24   was some data and that your local search could

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```
1        get to that data but there was another way

2        called Local Universal that could get to the

3        same data?

4                A.   I would describe it a little

5        differently.

6                     The data was used to populate the

7        local search index and that same data was used

8        by a different team to create a separate search

9        index which was used in Local Universal.

10               Q.   But they were different indexes?

11               A.   That's right.

12               Q.   So at some point you had

13       communications with Art+Com?

14               A.   Yes.

15               Q.   Do you remember when the first

16       such communication was?

17               A.   My recollection is meeting them in

18       Berlin.

19               Q.   Okay.  Had -- I assume when you

20       say "Michael," you mean Mr. Jones?

21               A.   I do.

22               Q.   Had Mr. Jones already met with

23       Art+Com before suggesting to you that you meet

24       with them?
```

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```
 1                    A.   Michael knew the people that he

 2       suggested that I meet with while I was in

 3       Berlin.

 4                    Q.   Do you know how he got to know

 5       them?

 6                    A.   My understanding was that he knew

 7       them from SGI days.

 8                    Q.   What is SGI?

 9                    A.   Silicon Graphics.

10                    Q.   Had he been at SGI previously?

11                    A.   That is my understanding.

12                    Q.   What employees of Art+Com -- which

13       employees of Art+Com did you meet?

14                    A.   I don't remember.

15                    Q.   Do you remember how long the

16       meeting was?

17                    A.   Seems like it was one to two

18       hours.

19                    Q.   Was it as Art+Com's facility?

20                    A.   It was at their office.

21                    Q.   What do you remember being

22       discussed at that meeting?

23                    A.   I remember seeing some demos of

24       things that they had done.  There was a
```

1   projection demo of some sort that I don't think

2   involved earth imagery, I think it involved

3   something else, that was cool. They showed an

4   interesting demo of -- it was a movie of a

5   person through time, visualizing how that

6   three-dimensional shape basically moved in

7   space, like in a movie sequence. So they had

8   done an interesting visualization of that, and

9   we spent some time looking at that and

10   discussing it.

11   And there was a demo that they

12   showed on the patio or roof of their building

13   involving binoculars that basically -- their

14   office overlooked the Brandenburg Gate, and by

15   looking through the binoculars you would see the

16   historical -- a historical photograph that was

17   registered on to the view so that it appeared

18   that you were sort of looking at the scene as it

19   existed just after the Second World War.

20   And they did show us their earth

21   rendering. I remember seeing some of that.

22   Q.   Was there any discussion of a

23   business relationship?

24   A.   The purpose of the meeting was to

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```
 1        explore if there could be some projects that we

 2        could work on together.

 3                Q.   Do you remember any specific

 4        projects that were discussed?

 5                A.   It was a free-ranging discussion

 6        through the day about just kind of exploring

 7        what they had done with the idea of maybe

 8        landing on something that we could do together.

 9                Q.   Other than that meeting in Berlin,

10        have you met with Art+Com since?

11                A.   I don't believe so.

12                Q.   After that meeting, did you have

13        any internal discussions with -- among Google

14        employees about a potential business

15        relationship with Art+Com?

16                A.   Yeah, we talked about, you know,

17        potential projects that we could do with them

18        based on the demos that they had showed us, but

19        didn't come up with any ideas that seemed to fit

20        what we were doing.

21                Q.   Do you remember ever discussing

22        acquiring Art+Com?

23                A.   I do not.

24                Q.   Did you have any communications
```

```
 1        with Art+Com after this meeting?

 2                 A.   Subsequently, there were E-mails

 3        from them.

 4                 Q.   Was there anything that Michael

 5        told you about Art+Com that interested you

 6        enough to have that first meeting?

 7                 A.   Yes.

 8                 Q.   What was that?

 9                 A.   He said they were cool and they

10        were doing things related to earth visualization

11        and I should meet with them while I was in

12        Berlin.

13                 Q.   Having viewed this E-mail, and

14        that E-mail specifically to you, does that

15        refresh your recollection regarding Pavel Mayer?

16                 A.   That must have been one of the

17        people I met at Art+Com.

18                 MR. HAWES:   I'm going to hand to

19        the court reporter a document to be marked as

20        Exhibit 2.

21                 Q.   The document bears Bates numbers

22        GOOG_AC_39304 through 06.  And at the bottom I

23        see, "BAM/MTJ-What's your opinion based on

24        performer/SGI days?"
```

```
1                    Do you see that?

2          A.   I do.

3          Q.   Do you know, is MTJ Michael Jones?

4          A.   It is.

5          Q.   Who is BAM?

6          A.   Brian McClendon.

7          Q.   So were both Michael Jones and

8    Brian McClendon at SGI?

9          A.   That's my understanding.

10         Q.   Below that there is an e-mail from

11   you on June 8.

12                   Do you see that one?

13         A.   I do.

14         Q.   That e-mail begins with "Art+Com

15   is cool."

16                   Do you see that?

17         A.   I do.

18         Q.   There is another reference here to

19   Pavel?

20         A.   I do.  Yes, I see that.

21         Q.   Does this E-mail refresh your

22   recollection about any of the folks you met at

23   Art+Com?

24         A.   I'm guessing Pavel was one of the
```

```
 1        people I met there.

 2                 Q.   But do you remember anything based

 3        on this E-mail?

 4                 A.   I remember liking the -- one of

 5        the main people that showed us around that day.

 6                 Q.   In the third paragraph you have

 7        "Payment plus big block of design plus

 8        consulting services..."

 9                      Do you see that sentence that

10        starts with those words?

11                 A.   I see that.

12                 Q.   And it talks about favored option.

13        Do you see that one.

14                      (Reading.)

15                      "Payment plus big block of design

16        plus consulting services would be my favorite

17        option... "

18                 A.   Got it.

19                 Q.   At some point -- was that your

20        favorite option through the discussions with

21        Art+Com?

22                 A.   I -- my recollection based on

23        reading this is that this exchange was after the

24        visit and it was, again, this discussion about
```

```
 1     is there a way to collaborate with Art+Com.

 2               Q.   Did your view as to your favorite

 3     option change after this E-mail?

 4               A.   I don't recall it changing, no.

 5               Q.   Do you recall why you didn't move

 6     forward on your favorite option?

 7               A.   My recollection is that we could

 8     never figure out a project, a specific project

 9     to have them work on that fit these general

10     parameters that would have added, you know,

11     value to us.

12               Q.   I don't want to get into legal,

13     but did you get corporate development and biz

14     development rolling as you discussed there?

15               A.   My recollection is that the next

16     step in the process was trying to figure out a

17     specific project, and we didn't get beyond that.

18     We never came up with an idea that we felt like

19     made sense to have them pursue.

20               Q.   Do you agree that Google Earth in

21     June of 2006 was generating goodwill for Google?

22               A.   I think it did.

23               Q.   Would you agree that Google Earth

24     was started by you as Keyhole in January 2000?
```

```
 1              A.   We started working on it and the

 2      idea of spinning it out around about then.   I

 3      don't think we formally incorporated until

 4      January of 2001, as I recall.

 5              Q.   That point also says that

 6      intrinsic graphics was started by Michael Jones

 7      and Brian McClendon who are now part of the

 8      Earth team.  Is that your understanding of how

 9      Intrinsic Graphics was started?

10              A.   My understanding is that there

11      were four co-founders and they were two of them.

12              Q.   The next list here under history

13      is that it was acquired in October 2004 by

14      Google?

15              A.   Mm-mmm.

16              Q.   Would you agree that 1.0 and 2.0

17      were done during the days of Keyhole and that

18      3.0 was done at Google?

19              A.   Yes.  We had released Earth Viewer

20      1 and then Earth Viewer 1. successive releases

21      and then we released Earth Viewer 2 and --

22      before we were acquired.  So when we released

23      the Google Earth, we debated about whether to

24      call it Version 1.0 or to continue the sequence
```

1   from Earth Viewer to 3.0. And we decided to

2   continue the sequence and to call it 3.0. So

3   the first version of Google Earth inside of --

4   the first version of Google Earth was Google

5   Earth 3.0.

6   Q.   And that's the version we've

7   discussed as being launched in June of 2005?

8   A.   Correct.

9   Q.   I believe you said that Keyhole

10   basically started from scratch in building Earth

11   Viewer; is that correct?

12   A.   Yes.

13   Q.   Why did the Geo group track unique

14   visitors per month?

15   A.   It's one of the acceptable

16   methodologies in Google for tracking the success

17   of a product, how many people are using it.

18   Q.   I'm going to ask the court

19   reporter to mark as exhibit Goog-AC-73098

20   through 114. So this document is dated December

21   17th, 2010. If you'll look on the first page.

22   And that's when you were still the vice

23   president of product management for the Geo

24   group?

```
 1                    A.    I believe so.

 2                    Q.    Can you tell me what derived

 3      revenues means?

 4                    A.    I think in the context of this

 5      document it's referring to revenue not generated

 6      directly by Geo within the products offered by

 7      Geo, but by other products.

 8                    Q.    Do you remember meetings

 9      discussing derived revenues during your time at

10      Geo?

11                    A.    Yes.

12                    Q.    The title of the slide is Google

13      runs on Geo.  Do you see that?

14                    A.    Mm-mmm.

15                    Q.    And it has IP Geo and then it

16      talks about what is IP Geo?

17                    A.    IP Geo is taking an IP address

18      from which a query is issued and understanding

19      the latitude and longitude that corresponds to

20      that IP address.

21                    Q.    Seventh down it says Google Earth

22      has installed more than 10 percent of all Chrome

23      7DA users.  Do you see that?

24                    A.    I do.
```

```
 1                    Q.   And it says saving nearly $100

 2      million in referrals payments per year.  Do you

 3      see that?

 4                    A.   I see that.

 5                    Q.   And what are the referrals

 6      payments?

 7                    A.   Google would pay a referral fee to

 8      a third party, like a Dell, for example, if

 9      somebody activated or installed Chrome, you

10      know, from that new computer.

11                    Q.   Was that true prior to 2010?

12                    A.   Yes.

13                    Q.   The next page, which is 102,

14      starts out with derived revenues will align

15      incentive structure with our local strategy.  Do

16      you see that?

17                    A.   Mm-mmm.

18                    Q.   And what is the incentive

19      structure?

20                    A.   Well, I thing what's being 2argued

21      hear, is that the, by assigning credit for these

22      revenues to Geo, then it will create the right

23      investment incentive for the company.

24                    Q.   The last bullet point talks about
```

1   Geo's contribution to other FA's. Do you see

2   that?

3   A.   Mm-mmm.

4   Q.   What are the FA's?

5   A.   Focus areas.

6   Q.   What contributions did Geo make to

7   the Search, Mobile and Android focus areas?

8   A.   I think the argument being made

9   here is that the local data that is used in the

10   Local Universal results when the query is about

11   a local topic originated in Geo, so, therefore,

12   contributing to Search in that way, that data

13   being available to make Search better. In

14   Mobile and Android, that would be referring to

15   the presence of Google Maps for Android and

16   Google Maps for iOS and Google Earth for Maps

17   and Google Earth for iOS.

18   Q.   The next page 103 of Exhibit 16 is

19   titled revising the P&L to reflect full value of

20   Geo.

21   A.   Mm-mmm.

22   Q.   Did you ever advocate for revising

23   the P&L to reflect the full value of Geo?

24   A.   I did.

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```
 1                    Q.    Can you turn with me to Page 108?

 2                    A.    Yes.

 3                    Q.    Do you agree that the Geo features

 4      ultimately accrete to Google through increased

 5      usage ad revenues?

 6                    A.    Value to users provided by these

 7      features which ultimately accretes to Google

 8      through increased usage/ads revenues.  Yes.

 9                    Q.    Do you have any disagreement with

10      the second bullet point, that one that starts

11      market value?

12                    A.    I'm not sure I understand what

13      that bullet means.

14                    Q.    Do you have any difficulty with

15      the third -- I guess the fourth bullet point if

16      you include the filled in one, value is provided

17      not just by --

18                    A.    But also by users -- by providing

19      users with the phone numbers, driving

20      directions, and address information, yes, I

21      think that's -- that is value.

22                    MR. HAWES:  Your Honor, we would

23      offer into evidence Plaintiff's exhibit number

24      71.
```

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```
 1                    MR. SNYDER:  No objection.

 2                    THE COURT:  It's admitted.

 3                    MR. HAWES:  And Your Honor, I

 4      think everyone will be glad to know this is our

 5      last deposition clip for the day.  And it's only

 6      three minutes long.  This deposition clip is of

 7      Olivier Bailey, who is an engineer at Google and

 8      will just be discussing one document of his that

 9      he prepared.

10                    (Video playing.)

11             Q.   Okay.  Could you please state your

12      full name?

13             A.   My full name is Olivier Bailly.

14             Q.   Do you work for Google?

15             A.   Yes.

16             Q.   In what position?

17             A.   I'm a software engineer.

18             Q.   When did you first start working

19      for Google?

20             A.   In October 2004.

21             Q.   Exhibit 4 is a document that you

22      posted to Google wiki on April 12th of 2007.

23             A.   April 12th, 2007 is the latest

24      revision of the document.
```

```
 1                    Q.   Okay.   The title of the document

 2         is cookie-based identification of Google Earth

 3         users?

 4                    A.   Yes.

 5                    Q.   Do you recall why you posted this

 6         document to Google wiki?

 7                    A.   Yes, vaguely, not extremely well.

 8         It was a long time ago, but I do recall posting

 9         this document.

10                    Q.   Okay.   Tell me what you recall of

11         your reasons for doing that?

12                    A.   It was a decision -- it was an

13         idea pitched to me by Chikai Ohazama of whether

14         we could use Google Earth as a platform to

15         present better results for it was why we

16         believed that Google Earth was a very solid

17         platform to show geographic relevant data.

18                    Q.   Okay.

19                    A.   But at the same time there was new

20         means for us to decide whether a user had Google

21         Earth installed on their machines, therefore the

22         idea was pitched to come up with a, a way to

23         just, to make a decision.   One of the idea being

24         install a cookie and this is what this document
```

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```
 1        highlights.
 2                   Q.   Is the idea being that when --
 3        that if I am using on Google Search, that there
 4        might be some advantage to Google's knowing
 5        whether I have Earth downloaded on my computer?
 6                   A.   It was just a position.
 7                   Q.   Okay.
 8                   A.   There was no concrete knowledge.
 9                   MR. HAWES:  Your Honor, ACI offers
10        into evidence Plaintiff's exhibit #40 as
11        redacted by agreement of the parties.
12                   MR. SNYDER:  No objection.
13                   THE COURT:  That's admitted.
14                   MR. HAWES:  Your Honor, ACI calls
15        as its next witness Mr. Jim Nawrocki.
16                   THE COURT:  Okay.
17                        JAMES J. NAWROCKI,
18                   the deponent herein, having first
19                   been duly sworn on oath, was
20                   examined and testified as follows:
21                   THE COURT:  You may proceed if
22        you're ready.
23                   MR. HAWES:  I believe we are, Your
24        Honor.  Thank you.
```

```
 1    BY MR. HAWES:

 2              Q.   Mr. Nawrocki, by whom are you

 3    employed?

 4              A.   I am employed by IPFC Corp.

 5              Q.   And what is your position at IPFC?

 6              A.   I'm a managing director.

 7              Q.   And have you prepared a slide

 8    concerning your background?

 9              A.   Yes, I have.

10              Q.   Well, I'm going to try and get it

11    on the screen.

12              A.   Okay.

13              Q.   There it is.  Could you describe

14    for the jury your educational background?

15              A.   Yes, I attended St. Mary's

16    University.  I graduated with a bachelors in

17    business administration/accounting and that was

18    in 1979.

19              Q.   Could you describe for the jury

20    some of your professional accomplishments?

21              A.   Yes, I'm a certified public

22    accountant, CPA.  As it shows here, I'm

23    certified in financial forensics.  That's

24    basically accounting for analytical type
```

```
 1        purposes, investigations.  I'm also a member of

 2        the Licensing Executive Society.  That's a

 3        worldwide organization of thousands of people,

 4        business representatives, legal community,

 5        consultants dealing with licensing of patents

 6        and things such as that.

 7                 Q.   What projects have you had that

 8        related to internet products?

 9                 A.   Over the years I have worked with

10        a lot of different cases or engagements

11        involving the internet.  I have had cases

12        involving Microsoft, Yahoo, Overture was a

13        company before it was Yahoo that did paid

14        searches, and I worked with them on intellectual

15        property or patent matters.  Linked-In, Amazon,

16        companies such as that.

17                 Q.   Do you work for plaintiffs or

18        defendants?

19                 A.   I work for both, both plaintiffs

20        and defendants in analyzing valuation issues

21        relating to intellectual property or patents.

22                      I should explain just for a second

23        what intellectual property is.  It's sometimes

24        called IP, which is the IPFC of my company,
```

```
 1        Intellectual Properties Financial Consultants,

 2        things such as patents, copyrights, things such

 3        as that, trade secrets.

 4                 Q.    What was your assignment in this

 5        case?

 6                 A.    My assignment was to review the

 7        information produced in this case by the parties

 8        and develop my opinion in terms of what the

 9        damages would be based upon Google's alleged

10        infringement of ACI's patent.

11                 Q.    What guidance did you have for a

12        starting point in undertaking that analysis?

13                 A.    So the overall guidance that I

14        looked to as part of my analysis is there was a

15        statute, it's called 284, it's here on the

16        screen you'll see it, and it's related to

17        damages, it provides broad guidance.

18                       It says that damages should be

19        adequate to compensate for the infringement, but

20        in no event less than a reasonable royalty, so

21        the royalty, the reasonable royalty would be the

22        floor and it gets applied to the use made, so it

23        says for the use made of the invention by the

24        infringer.
```

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```
 1                    Q.   You just mentioned a reasonable

 2       royalty.   What's a royalty?

 3                    A.   So people have probably heard the

 4       expression royalty.   There is royalties are like

 5       a rent payment for a piece of property.   So if

 6       you own a house, you can pay rent for that, or

 7       receive rent for renting out your property.

 8                         Well, there is royalties on movie

 9       rights, book rights, song rights, a royalty in

10       the patent area would be for use of the patent.

11                         I have got a chart that I think

12       gives you a little bit of an example.   So on the

13       top portion there if you're looking at song or

14       music there would be a song owner.   You can use

15       the Beatles or you can use someone like Cold

16       Play, whoever you want to put in that box.

17                         But let's say a company like

18       Spotify or Pandora was going to play that music,

19       they would have to enter into an arrangement

20       with either the Beatles or an organization that

21       represents the Beatles to pay a license for

22       that.   That would be in this instance a song

23       license agreement and that royalty would be per

24       play.
```

1   And I work with some companies

2   like AOL or cases involving AOL that have had

3   radio licenses and the same type of arrangement,

4   a certain amount paid for each song.

5   In the patent context, which is on

6   the bottom side, there is a patent owner, you

7   own the patent, that gives you the right to

8   exclude others or you can license others.

9   The next box, second box I show is

10   the license or that is the owner of the patent

11   would be AIC, and even then the licensee would

12   be Google, so it's a little tricky with names,

13   licensor or licensee.

14   They enter a patent license

15   agreement and there would be a royalty for that,

16   a royalty per use could be per activation, per

17   session, what have you, some type of royalty for

18   that use of the technology that as the patent

19   owner you would receive.

20   Q.   What did you look at to understand

21   Google's business?

22   A.   I looked at Google's documents.

23   As part of my involvement there were numerous

24   documents produced by both parties. Google

1   produced a volume of information, business

2   plans, presentation. You heard some discussions

3   about Geo, the Geo business group. You seen a

4   lot of the documents that I referred to with

5   some of the prior witnesses.

6   To start my analysis I looked at

7   their overall strategy with Google which dealt

8   with something called the network effect. I

9   think there is a slide on that as well.

10   Q.   This document is confidential, so

11   we'll do our special trick here and cut that

12   off.

13   A.   Okay.

14   Q.   This is Plaintiff's Trial Exhibit

15   158. Could you tell the jury what was important

16   about this document for you?

17   A.   This is the document that in

18   approximately 2005 or 2006, it deals with the

19   strategy framework for Google. And you'll see

20   at the top, there is a network effect, it's

21   called the UIAP model. The UIAP sounds a little

22   bit tricky, but it's the letters that are in

23   those circles there. That shows the interaction

24   of having users, information, advertisers and

```
 1        publishers all working together within the
 2        Google framework to obtain their revenue model.
 3                    And as an example, we heard a lot
 4        of talk about users and trying to attract users,
 5        that's a part of it, how they monetize that if
 6        you take the arrow over to the right you see
 7        they have advertisers that will provide
 8        information to users and that will be monetized
 9        by Google.
10                    You look at a few of the points
11        there, if you go to the bullet points down
12        below, for example, one of the things that they
13        identified here was having the most users,
14        advertisers and publishers provide data that we
15        use to increase targeting/relevance.  They call
16        that the network effect.  They want to get as
17        many users as they can on their platform.
18            Q.   Why was increasing targeting and
19        relevance important?
20            A.   Well, because they would be able
21        to obtain additional advertising revenues and
22        even higher rates if you were able to target.
23        I'll give you an example.  Let's say you have a
24        restaurant here and somebody does a search for a
```

```
 1        hamburger restaurant.  If you get all the
 2        hamburger restaurants in the country, that's
 3        okay.  But if you want people to specifically
 4        get a restaurant in a specific location, that
 5        might be more attractive and so advertisers
 6        would pay more for that for someone with a
 7        certain location.  Let's say you go to
 8        Wilmington and look up a restaurant, there is
 9        place called Chelsea's as an example on Market
10        Street.  If you wanted to look for that place,
11        you can find it and somebody here would pay more
12        than if you were in Los Angeles getting
13        Chelsea's because there would be that
14        connection.  So you pay more when you have more
15        information about the business.
16                Q.   Anything else in this slide that
17        you felt was important?
18                A.   Yes.  The next bullet point is
19        somewhat similar, it says users are the focus of
20        everything that we do.  This is again Google
21        talking.  The model hinges upon having the most
22        users, happy and engaged users.  Our number one
23        focus is on end users experience.
24                Q.   Did you see the video we just
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 1        watched of Mr. Bailey?

 2                 A.   Yes, I did.

 3                 Q.   And the document he was referring

 4        to, is that one you reviewed?

 5                 A.   Yes, I did.

 6                 Q.   And that's Plaintiffs's Trial

 7        Exhibit 40, and I'm going to bring up a slide of

 8        that.  Can you just read for the jury the text

 9        that you have highlighted there?

10                 A.   This document talked about earlier

11        and within Google Earth it says that as part of

12        it, part of their analysis there, this would

13        cause more users to reuse this product and in

14        turn, trigger Google.com traffic.  This is an

15        example of showing the interrelationship of

16        using Google Earth with the overall Google.com

17        platform.

18                 Q.   So Plaintiff's Trial Exhibit 115

19        has the title of Geo Properties P & L.  Can you

20        explain what P & L means for the jury?

21                 A.   Yes.  So you can't see the title

22        too well.  It's up in the corner.  The P & L

23        refers to profit and loss.  So the Geo is a

24        business segment of Google and so this would be
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 1        their profit and loss.  This document actually

 2        went through different revenue and cost

 3        scenarios.

 4                 Q.   What does this page of the

 5        document show?

 6                 A.   It's entitled How Does Geo Make

 7        Money.  How does Geo make money.  Again, Geo is

 8        this business segment within Google.  And under

 9        the direct sources of revenue, the first one

10        they identify is Google Earth.  And there are

11        several different offerings.  Basic, which is

12        free.  Google Earth Plus was a $20 upgrade.  Pro

13        was available for $400.  And Enterprise varied,

14        for a per seat license it varied from

15        approximately $100 to $400 for Google Earth per

16        user per year.  So you kind of get a feel for

17        the range of prices there for this Google Earth

18        product.

19                 Q.   This says direct sources.  What

20        indirect sources were discussed?

21                 A.   I believe the next page or a few

22        pages down, yes, this one gives an

23        identification of some of their considerations

24        at this point in time for indirect sources.
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1   What we'll see is they're continuing to access

2   how they can make money. This identifies some

3   indirect sources.

4   The first bullet point underneath

5   indirect sources talks about ad revenues

6   conducted through Toolbar that were sold via

7   downloads of Google Earth. That was talked

8   about earlier how you could use the Google Earth

9   to download other products and that would save

10   them money.

11   And they also talk about the

12   additional searches from that and they start

13   quantifying that down below. We won't go

14   through this whole document, but you'll see some

15   of the numbers down there. The 97 million is

16   one assessment. They make other assessments

17   depending on different assumptions between 26

18   and $97 million just for the search revenue that

19   would relate to the downloads that they have.

20   Q.   What type of information does

21   Google keep about the growth rates of their

22   products?

23   A.   They basically keep a variety of

24   information on how their products grow over a

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1   period of time. And you'll see at this point in

2   time they're taking a look at these products

3   growing rather significantly when they compare

4   to prior years.

5   So later on in that same profit

6   and loss document, this one shows again how

7   Google makes money under the first few bullet

8   points, they show Earth Pro revenues increase by

9   a hundred percent over 2005. It was first

10   introduced in 2005. They increase their

11   revenues a hundred percent in that one year.

12   For that Enterprise, which was

13   that business product that was talked about in

14   some of the depositions, that increased by 200

15   percent. They're comparing as best they can

16   some of the direct revenue sources here.

17   Q.   What was the role in Geo of Google

18   Earth at this time?

19   A.   So what you'll see down below is a

20   spreadsheet is a summary of their revenues.

21   This isn't their whole profit and loss, this is

22   just their revenues. But in 2006, this is the

23   first full year after they introduced it, you

24   will see the revenues. So on the right side

```
 1        you'll see the grand total to the bottom, $53

 2        million.  And there is several Earth products

 3        identified.  If you add those up, the Earth

 4        Plus, the first one, the Earth Pro, the Earth

 5        Enterprise, the next one, and then there is

 6        Sketch Pro, some other products, if you add the

 7        bottom one that Google Earth has, you add all

 8        those up, that represents more than 50 percent

 9        of the Geo platform at this point in time.

10               Q.   So Plaintiff's Trial Exhibit 167

11        is a Geo business discussion document.  What did

12        you learn from this document?

13               A.   If you could pull -- okay.  So

14        this is a little bit later in time.  It's

15        approximately 2008.  So now we're going forward

16        a couple of years, and this is a continual

17        assessment by Google of how they look at the Geo

18        products.

19               So what you'll see here is in the

20        first box to the left there, it's an extension

21        of core search.  So when they think about Geo,

22        these Geo products such as Earth and Maps, they

23        think of it as an extension of their core

24        search.  Core search is a prominent offering for
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 1        Google, they think of it as an extension there,

 2        you'll see within the picture some diagrams of

 3        Earth as well as Maps.

 4                    Q.    Am I highlighting the right spot?

 5                    A.    Yes, the extension of Core.

 6                    So the Geo product under extension

 7        of that.  If you look down below they're

 8        identifying across the board what some of the

 9        important objectives are.  Across the board

10        their objectives are growing users and usage

11        within the core search aspect of it, generated

12        by the products and they're also identifying

13        here the mobile products that were talked about

14        as well.

15                    Q.    At this time did Google have some

16        ideas on exactly why growing users and usage

17        would make more money?

18                    A.    They were beginning to identify

19        that, that we talked about some of the direct

20        revenue sources and they continued to assess

21        some of the indirect revenue sources, so this

22        next chart shows what's justifying any

23        investments we're going to make here.  We're

24        going to have this Google Earth platform.  It's
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 1        going to take some investments and is this going

 2        to be beneficial to us or not.

 3                    The left bar, Geo equals a creed

 4        of earns.  A creed of earnings means above and

 5        beyond your investments you make a profit.  You

 6        make an investment and you lose money, well then

 7        that's not a creed.  You make money, then that's

 8        a creed that adds to your earnings.

 9                    They identified several areas.

10        They would have under that first bullet point

11        incremental search usage.  We talked about that

12        before.  Over to the left they would have better

13        ad targeting by having geographic locations for

14        people, they could target ads more specifically.

15        And they would also begin looking at new ads

16        formats, different types of formats of ads.  As

17        we go through the Google documents, you'll see

18        different monetization efforts they identified.

19             Q.   What was the bottom line regarding

20        users and usage according to their Geo business

21        group at this time?

22             A.   It's right in the middle,

23        monetization will follow users.  Them making

24        money, in other words, will follow users and
```

1   usage. The more users they have, the more usage

2   they have, that will lead to additional revenues

3   for them.

4   Q.   What analysis did you perform of

5   Geo revenue drivers?

6   A.   There is another -- I believe the

7   next page has an analysis of what they regard as

8   drivers of revenue from the Geo platform.

9   And to continue the theme that far

10   on the left is their core search, they identify

11   that prominently, that's their core search

12   product. The first bullet point says they'll

13   have more local queries on Google.com. Not only

14   are you using Maps or using Earth, but it will

15   also generate additional queries on the overall

16   Google.com platform. They refer to the new ad

17   formats on the left side and they talk about

18   greater search usage from the Earth Toolbar

19   downloads.

20   Q.   So based on all these strategies

21   for making money, what was Google's overall

22   investment focus?

23   A.   So as you can see, they're

24   continuing to look for investing in users and

```
 1        usage.  This next chart titled how Google invest

 2        shows that.  It says how we invest in Geo and

 3        their overall investment strategy was to get

 4        users, additional users, usage and monetization

 5        which revealed more revenue.  And again Google

 6        Earth we'll see from some of the numbers we're

 7        going to get into either today or tomorrow, take

 8        is that they have generated a lot of users and a

 9        lot of usage and that led to money for them.

10                Q.   Plaintiff's Trial Exhibit 271 is a

11        Geo business review.  How is this review

12        important to your analysis?

13                A.   This is a little bit later in

14        time.  It's approximately 2000.  I can't see the

15        document in the left-hand corner.

16                MR. HAWES:  Can we pull up

17        Plaintiff's Trial Exhibit 271.

18                A.   I just see the time period here.

19                Q.   Just so we can see it, make it

20        bigger for the jury.  Can you pull that up?

21                A.   So 2008.  So this is.

22                Q.   Can we go to page 16?

23                A.   About three years after they

24        bought Google Earth.  And now they're getting
```

1   fairly specific into different monetization

2   efforts, and this is for different ad type

3   platforms they had.

4   At the very bottom if you go to

5   the very bottom, you'll see, it says current

6   revenue, so they assess the current revenue,

7   that shown on the left side by traffic, that is

8   the volume of traffic they had, and on the right

9   side they had revenue in dollars.

10   And then they take a look above

11   that, they say here is the potential upside we

12   have. Here is all the other ways we can

13   monetize that.

14   What you'll see just to read a few

15   of those products, there is an interaction of

16   Map products, Geo codes, city Geo codes, right

17   above that, that whole category above that area

18   all three of those are Earth related products.

19   They were looking at the interrelationship of

20   areas in which they can continue to make money.

21   They were making money on the current side, but

22   they were looking for additional ways they can

23   monetize this. And again, it started early on

24   after they implemented or released I should say

```
 1        Google Earth and it continued over the periods

 2        of time.

 3                 Q.   What advantages did this --

 4                      THE COURT:   We're already five

 5        o'clock.

 6                      MR. HAWES:   I believe this is the

 7        last slide for this particular plaintiff's

 8        exhibit if you wouldn't mind us finishing that.

 9                      THE COURT:   All right.

10                 Q.   Could you identify for us on this

11        particular slide what Google said were the

12        advantages they foresaw from these efforts?

13                 A.   Yes, hiding up in the right-hand

14        corner there they identify a few bullet points,

15        so this is really a busy chart.

16                 Q.   Could we blowup the top right?

17                 A.   Yeah, there you go.

18                 Q.   Can you blow that up so -- no one

19        can read it.

20                 A.   Yeah.

21                 Q.   There you go?

22                 A.   So they want to have an increase

23        and add inventory, new traffic, new monetization

24        efforts, new ad UX and improve ad targeting,
```

```
 1        which we've been talking about as well.

 2        Continue evolution of them assessing different

 3        ways they can monetize this platform Google

 4        Earth that's been so attractive to them and

 5        their uses.

 6                     MR. HAWES:  Thank you, Mr.

 7        Nawrocki.  I think we'll be finishing for the

 8        day.

 9                     THE COURT:  Thank you, Mr.

10        Nawrocki.  You're excused for the evening,

11        resuming at 9 o'clock tomorrow.  You should not

12        discuss your testimony with anyone.

13                     THE WITNESS:  Okay.  Thank you.

14                     THE COURT:  Okay.  So members of

15        the jury, we'll recess until tomorrow morning.

16        Thank you again for your service and please

17        remember, do not discuss the case with anyone.

18        Do not research the case and we'll see you

19        tomorrow morning.  Thank you.

20                     (Jury exits.)

21                     THE COURT:  Okay.  Please be

22        seated.  Do counsel have anything to raise

23        before we recess?

24                     MR. PARTRIDGE:  I'm not aware of
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1   anything on Plaintiff's side, Your Honor.

2   THE COURT: Okay. Well, we'll be

3   available at 8:30 tomorrow morning and that

4   concludes for today.

5   MR. SNYDER: Thank you, Your

6   Honor.

7   (Court adjourned at 5:03 p.m.)

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 1    State of Delaware )
                        )
 2    New Castle County )

 3

 4

 5                  CERTIFICATE OF REPORTER

 6

 7          I, Dale C. Hawkins, Registered Merit

 8    Reporter, Certified Shorthand Reporter, and Notary

 9    Public, do hereby certify that the foregoing record,

10    Pages 408 to 766 inclusive, is a true and accurate

11    transcript of my stenographic notes taken on May 24,

12    2016, in the above-captioned matter.

13

14          IN WITNESS WHEREOF, I have hereunto set my

15    hand and seal this 24th day of May 2016, at

16    Wilmington.

17

18

19                    /s/ Dale C. Hawkins

20                  Dale C. Hawkins, RMR

21

22

23

24
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